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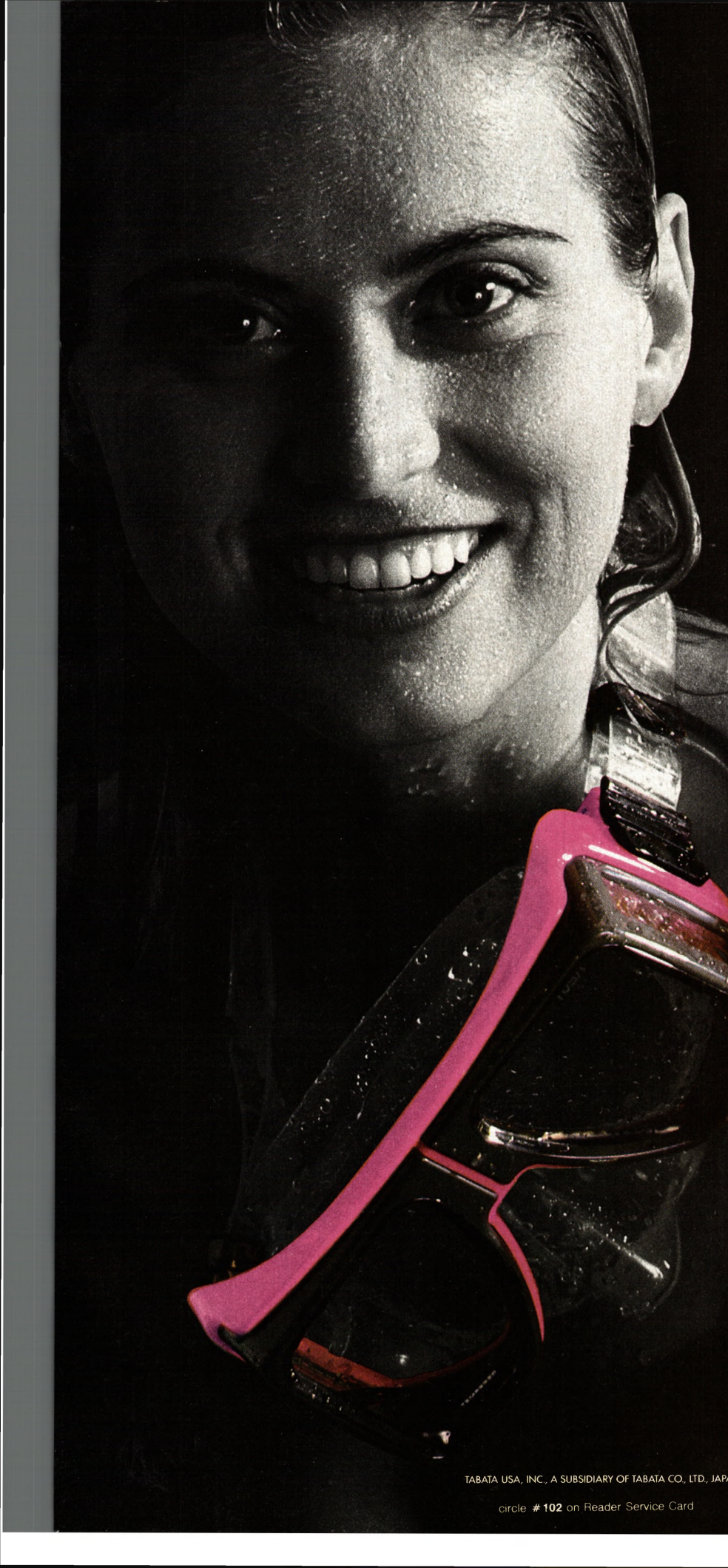
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skindiver

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Capt. Slate feeds a moray eel in the Florida Keys. For more on such activities, see page 48. Photo/Stephen Frink.

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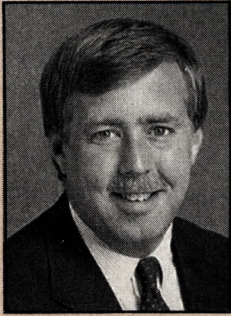
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SDM EDITORIAL

By Bill Gleason

60 FEET A MINUTE IS A LONG, LONG TIME

SKIN DIVER is issuing you a challenge. As a competent, certified diver, ask your buddy to time you on a normal ascent from 60 feet to the surface. Have your buddy mark a slate in 10 foot increments (50, 40, 30, etc.) and jot down the times (in seconds) you reach each depth. You should make the ascent, according to "the book" in 60 seconds.

Based on SKIN DIVER's field testing, more than 80 percent of you will fail this test. A few will blow it completely and end up on the surface in less than 25 seconds. Most will get to the surface in less than 50 seconds. A few will take more than two minutes, but report taking only "slightly longer than a minute" to get up. If you would like an honest assessment of your diving skills, take this challenge. And, please take it honestly! Make a routine ascent, not a special "I'll be careful for the test" one. If you have never timed your ascent, or had it timed for you, you may come to the same conclusion SKIN DIVER did. If you're not looking at a watch and depth gauge, 60 feet a minute is a long, long time. Controlling your buoyancy is no easy trick while ascending. It's natural to ignore your watch and gradually speed up your ascent to the surface. From 30 feet to the surface, many divers are "bobbing" up, with explosive rates like 120 or even 180 feet per minute. You may have a slight nagging feeling ("Boy, I came up kinda fast") on the boat, and may even suffer an attack of the "Am I going to get bent" anxieties? You will keep these to yourself, of course, because the statistics are overwhelmingly in favor of your not getting bent! Even with so many divers violating the 60 feet/minute ascent rates very few people are paying the penalty! And, unfortunately, when you get away with something once, it's a little easier to rationalize the next time.

On the dark side, approximately 40 percent of bends cases happen to people that dove within the tables and just don't know how they got bent! They don't usually know their ascent rate either. If you take this test and, like 80 percent of divers, fail it; you'll realize you are putting yourself at unnecessary risk of becoming a "bends" statistic. Let's take a look at the entire ascent rate picture!

Question: What is the correct ascent

rate to use?

A. No one knows.

B. Sixty feet per minute.

Paradoxically, both are correct and incorrect. The experts say we should never exceed 60 feet/minute as an ascent rate. This does not mean that an ascent rate of 59.99 feet/minute is the correct one. The flip side of the coin says that for every second over 60 feet/minute (If, for example, it takes 80 seconds to get from 60 feet to the surface) you should add this time to your bottom time; suggesting a penalty for ascending too slowly!

Then, along come diving doctors and decompression computers. Sixty feet per minute is too fast, they say. It should be 30 feet per minute, some claim (and if you think 60 feet/minute seems like a long, long time, wait till you try 30!). Others suggest a mix/match approach. Sixty feet/minute is OK when you're deep, but when you reach shallower depths (60 feet to the surface), go slower.

For a diver faced with the possibility of getting bent this information is pretty damn confusing and not likely to get better. As computers proliferate, the discussion over ascent rates is going to escalate. For the confused diver, who just failed SDM's ascent test, or has had to endure the "I hope I don't get bent" fingernail lunch on the boat ride home, here's an easy solution. Slow down! And, plan to slow down! Here's how it works:

1. Build slowing down into your pre-dive planning. Subtract a minute or two off your planned bottom time to allow some flexibility if you err on the side of going too slow.

2. Time your ascents until you have a good feeling of what a 60 feet/minute ascent rate feels like. Then slow it down from 60 feet to 10-20 feet and hang there! ("Hanging" is a term we used to use to describe a decompression stop on a decompression dive. "Hanging" today refers to a safety stop of one to three minutes on a no decompression dive at 10-20 feet.)

Since the professors are not in agreement as to what rate to ascend and what depth to hang at, etc., the above plan coupled with the safety stop is the only way to go for a prudent diver. When we're talking lifetime paralysis as the downside, giving up a minute or two of

bottom time is good insurance!

Question: are newly certified divers trained well enough to make these ascents safely?

Answer: No. A newly certified diver is trained to ascend from a moderate depth under optimum conditions. Any deviation from these conditions and you increase risk. Experience and additional training are the keys to relaxed, safe ascents.

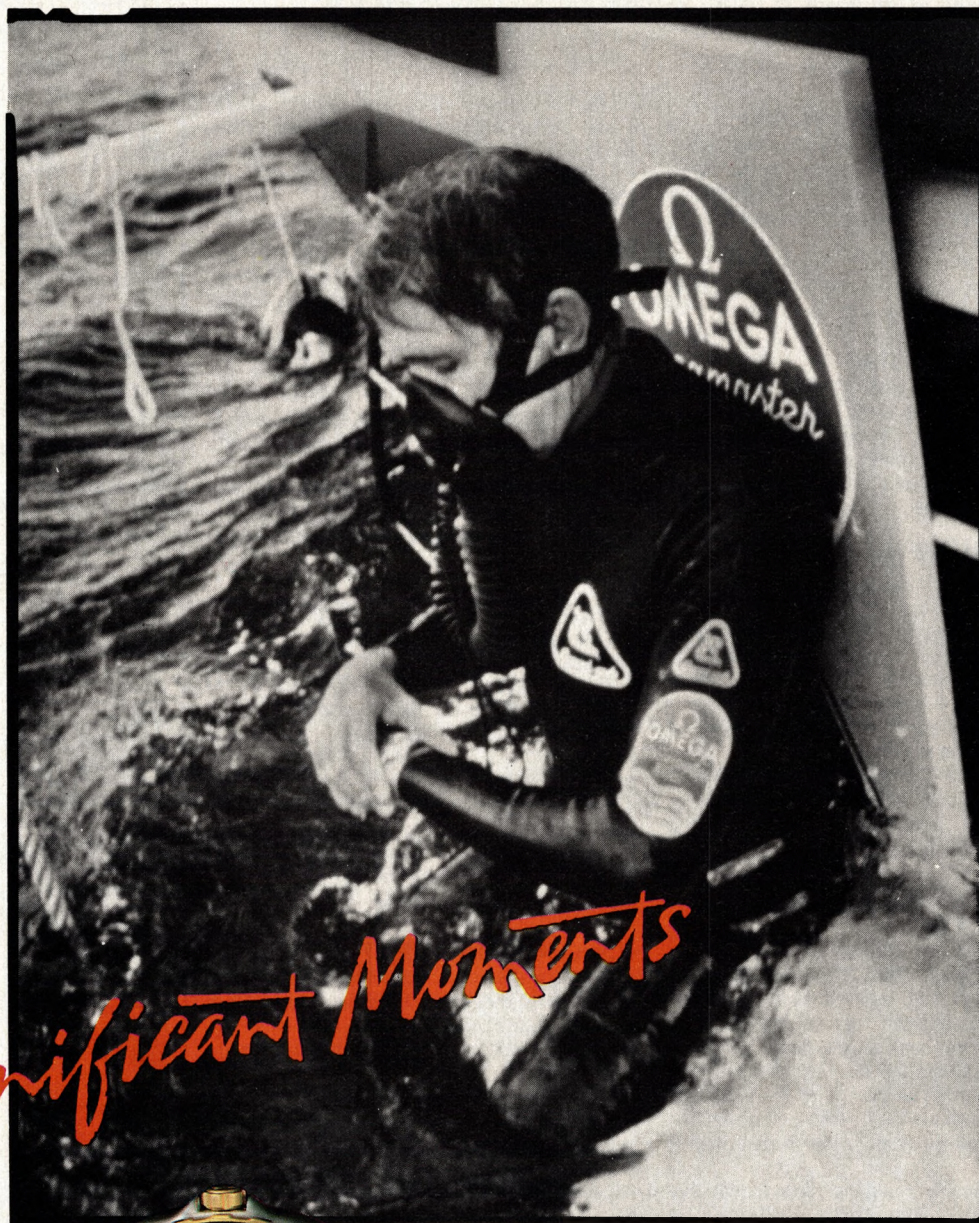
Try these little training tips. At the beginning (not the end) of a dive, try establishing neutral buoyancy at 10 feet and maintain it for a minute. At 20 feet do the same and also at 30 feet. If you deviate no more than three feet up or down, congratulations. You are either holding onto a line or are a very skilled, experienced diver. If you could not maintain buoyancy at these depths on the way down, what do you think your chances of maintaining it are on the way up? Slim, slim, slim. That's why 80 percent of divers fail the ascent test! And, no amount of certification and training will overcome this. Experience and practice will. Having the security of a line when you first begin practicing will be of enormous benefit to prevent "bouncing" to the surface and to catch you when you over/under compensate with your BC. This is the best method for getting proficient at maintaining buoyancy at 30, 20 and even 10 feet of depth!

Specific practice is the key to buoyancy control and buoyancy control is the secret to a safe ascent. After all, most people start their ascent planning to go 60 feet/minute. It's just a dangerous fact that 80 percent don't have the buoyancy control to finish that way. The ability to achieve neutral buoyancy on the bottom of a 15 foot pool or on a 60 foot sandy bottom does not qualify you to make safe, controlled ascents!

If you're part of those 80 percent who get to the top too fast, or are not in control all of the ascent time, go back to basics. The basics include descending and ascending on an anchorline until your buoyancy skills and ocean conditions allow you to make a safe, controlled ascent complete with safety stop.

Dive smart. Ascend slow and hang on every dive. Thirty to 60 feet/minute may seem like a long, long time but a couple extra minutes is the cheapest insurance against getting bent!

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DIVER'S CALENDAR

UNDERWATER NEW YORK

An Evening with Stan Waterman will be the entertainment for Underwater New York, which will be held **May 6** at Utica College in Utica, New York. The day program will include seminars and displays.

For information contact Raymond Tucker, Sly Hill Road, Ava, New York 13303; (315) 337-6938. ✉

FIRST AID COURSE

Berry Scuba will offer a PADI Medic First Aid course **May 20** at its store at 6674 N. Northwest Highway, Chicago, IL 60631. It is a one day certification course in first aid and basic life support. For information telephone (312) 763-1626. ✉

BUILD A REEF FOR MDA

The Professional Scuba Training Association of Central Ohio will host a fundraising event for the Muscular Dystrophy Association **May 20-21** at Lakeview Park, outside Lancaster, Ohio. Upon paying a \$10 fee each diver will receive a tire, which he or she will decorate as desired, then tie it to others attached to the bottom of the quarry.

For information contact Jeff Bocock, Subaquatics, Inc., 8855 East Broad Street, Reynoldsburg, Ohio 43068; telephone (614) 864-1235. ✉

INTERNATIONAL DIVERS CLUB SPLASH

The International Divers Club will host its annual Club Splash **May 21** at "The Reef" in Houston, Texas. The event is held to enable divers to check out their gear prior to the start of the "diving season" and to allow IDC divers to evaluate the divers' skills—as well as to just have fun. A portion of the entry fee will be donated to DAN. Events include an underwater treasure hunt, relay race and fin swim contest.

For information contact the International Divers Club, P.O. Box 1365, Bellaire, TX 77401. ✉

FLORIDA SPEARFISHING TOURNAMENT

The Panama City Dive Club will sponsor its 12th annual Miracle Strip Open Spearfishing Tournament **June 2-4** at the Treasure Island Marina in Panama City Beach, Florida. Many prizes and door prizes will be distributed and a fish fry and awards presentation will follow the tournament.

For information contact Tom Ledman, P.O. Box 4636, Panama City, Florida 32401; (904) 234-0226. ✉

NYS DIVERS CONVENTION

The New York State Divers Association will host its annual convention **June 2-4** at the Cresthaven Motel, Lake George, New York. Registration is \$5 and a banquet will be held at the motel June 4. Shore and chartered diving is available.

The deadline for reservations is May 15—contact the Cresthaven Motel at (518) 668-

3332. For information contact Paul Cornell, 12 Eagle Street, Gloversville, New York 12078; (518) 725-1333 or Jim DiFiore, 4216 Consaul Road, Schenectady, NY 12304; telephone (518) 374-1193. ✉

SEASPACE '89/IQ

This year's Seaspace, a scuba symposium sponsored by the Houston Underwater Club, will be held **June 2-4** at the Hyatt Regency in Houston, Texas. It will be held in conjunction with the National Association of Underwater Instructors' International Conference on Underwater Education (IQ). The Seaspace film festival will feature Stan Waterman, Marty Snyderman, Norbert Wu and others.

For information contact Seaspace '89, P.O. Box 3753, Houston, TX 77253-3753; telephone (713) 467-6675 or NAUI Headquarters at (714) 621-5801. ✉

MILLION DOLLAR WEEKEND

Dive stores along the U.S. East Coast will be hosting marathons, treasure hunts and other fundraising activities to benefit the Muscular Dystrophy Association **June 3-4**. This Million Dollar Weekend is expected to raise a major portion of the dive industry's \$1 million MDA goal for 1989.

Dive stores interested in participating in the Million Dollar Weekend can contact Jon Coon, PADI Regional Sales Manager, via PADI Headquarters at 1251 East Dyer Road, #100, Santa Ana, CA 92705-5605. ✉

NSUC ANNUAL MEETING

The Nova Scotia Underwater Council's annual general meeting will be held **June 10** in the sixth floor conference room of Polaris Hall, Bedford Institute of Oceanography, Dartmouth, Nova Scotia. A film/slide festival will be held that evening. Doorprizes, snacks and a cash bar will follow.

For information contact the Nova Scotia Underwater Council, AGM Committee, P.O. Box 34, Armdale Post Office, Halifax, Nova Scotia B3L 4J7. ✉

ARKANSAS TREASURE HUNT

Rick's Pro Dive 'N Ski Shop will host its 11th annual Underwater Treasure Hunt in Lake Ouachita, Hot Springs, Arkansas **June 11**. Sixty "treasure ships," with corresponding prize numbers, can be recovered by divers. The grand prize is a Tekna DV-3X underwater propulsion unit.

For information contact Rick's Pro Dive 'N Ski Shop, Inc., 2323 North Poplar, North Little Rock, Arkansas 72114; (501) 753-6004. ✉

SCUBA '89 PHOTO COMPETITION

Entries are now being accepted for the Scuba '89 Worldwide Underwater Photographic Competition, which is held in conjunction with Scuba '89, The Dive Show, at the Queen Mary in Long Beach, California **June 23-25**.

For an entry form send SASE to Scuba '89 Worldwide Underwater Photographic Competition, P.O. Box 11231, Torrance, California 90504. ✉

skin diver

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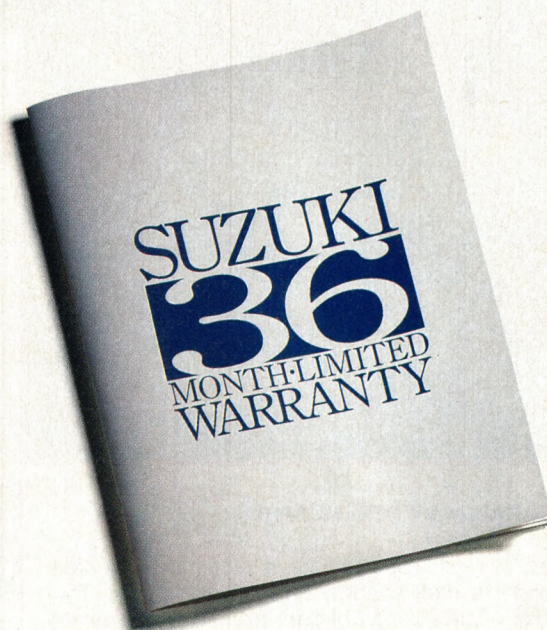
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Lesson 5 BASIC WIDE ANGLE FLASH TECHNIQUES



TEXT AND PHOTOGRAPHY BY GERI MURPHY

The use of a strobe underwater provides many benefits; it will make your pictures more interesting, more exciting and more beautiful.

BENEFITS OF FLASH

- Restores color
- Eliminates unwanted shadows
- Reveals more detail
- Increases sharpness
- Increases depth of field
- Increases contrast
- Establishes the mood

Restores color: Water acts much like a giant blue filter, removing certain colors from the spectrum of light. The colors that disappear first include red, orange and yellow. When an U/W strobe is used close to the subject, those colors are restored. Your photos are not only more colorful, they appear more natural.

Eliminates shadows: Available light photos taken underwater often contain dark shadow areas caused by overhanging coral ledges, part of a shipwreck or other opaque objects that block the sun's

rays. For example, a facemask can cast a dark shadow on the diver's face. The introduction of light from a strobe eliminates those shadows, making the picture more appealing and interesting.

Reveals detail: Flash can also reveal more detail in the picture area that may have gone unnoticed in an available light photo. It is the tiny color patterns and highlights that make a photo fascinating.

Increases sharpness: Flash helps to increase sharpness by allowing the picture to be taken at a smaller aperture setting. For example, an available light photo shot at 60 feet might be taken at f/2.8. The same photo with flash might be taken at an aperture setting of f/8 or 11.

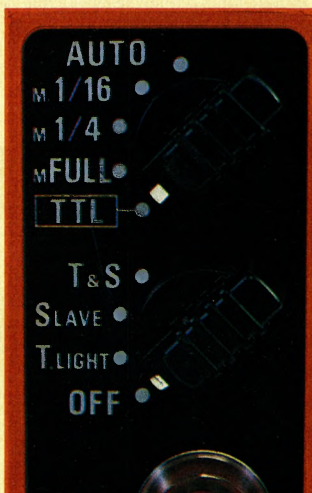
Increases depth of field: Flash helps to increase depth of field in the same way it increases sharpness. Smaller apertures automatically produce greater depth of field. To demonstrate this benefit, let us set the focus of a Nikonos 15mm lens for two feet. At a typical available light aperture setting of f/4, the depth of field would be from 1.5 to 3 feet. A typical flash setting of f/8 would produce a depth of field of 1.2 to 10 feet.



Top: A diver photographs an orange sponge while using wide angle flash. **Above:** A Nikonos camera with 20mm lens and SB 102 wide angle strobe.

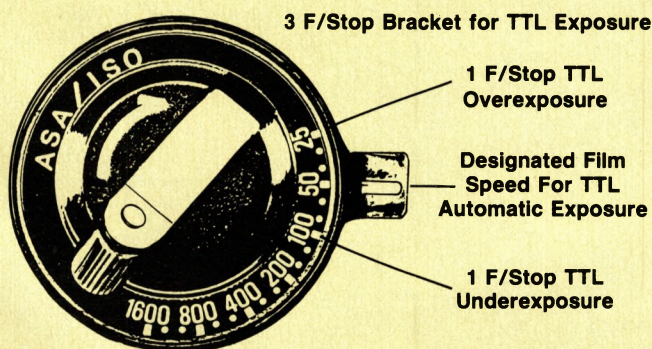
Increases contrast: The use of flash often makes underwater photos appear three dimensional. The flash helps separate the subject from its background because there is more reflected light on the subject than on the background.

Establishes the mood: The intended mood of the picture can be greatly altered by changing the lighting angle. For example, a grouper lit from the front would produce a warm, cheerful photo. The same fish lit from underneath might



Above left: The control panel of the SB 102 strobe. Above right: A diver photographs baitfish in shallow water on a cloudy day while using wide angle flash. Below: Flash photos have sharp detail because the extra light from the flash allows using smaller apertures (here f/11), which also offer greater depth of field.

The photo above was taken with a wide angle lens and no flash; the photo below, of the same subject, was taken with the same lens using flash.



To bracket your underwater photographs when using TTL automatic exposure, take one shot at the designated film speed, one at one-half that and one at twice the speed.

appear ghoulish or sinister. The scene can be changed again by lighting the fish from the top or the back, thus making a more dramatic presentation.

TWO DIFFERENT FLASH TECHNIQUES

There are two kinds of underwater flash techniques—*total flash* and *balanced flash*.

With total flash the subject is illuminated by light coming from the strobe only.

With total flash, ambient light is either nonexistent or too weak to be recorded.

Using balanced flash, the photo is illuminated by both ambient light and the strobe. This requires balancing the reflected light from the strobe precisely with the ambient light in the background for a single f/stop.

This lesson is devoted to total flash because it is the easiest of the two for beginners. Subsequent lessons will deal with balanced flash.

TWO STROBE MODES

Underwater flash can be accomplished by one of two different flash modes—TTL or manual. Both modes are effective and generally applied to different situations.

TTL flash achieves the exposure automatically by a sensor measuring the light coming through the lens (TTL). The TTL circuitry controls the amount of light striking the film by cutting off the duration of the strobe.

Manual flash requires the exposure to be made manually by the diver calculating the correct f/stop for the estimated strobe to subject distance. Exposure calculations are based on several factors, such as film speed, flash output and subject reflectivity.

This lesson is devoted to TTL flash because it is the easiest of the two. Subsequent lessons will deal with manual flash.

BASIC FLASH TECHNIQUE

Successful underwater flash photos
(Continued on Page 172)

The Nikonos-V System.

The Adventure of Diving.

It's a story about new discoveries. As you slip beneath the water's surface, you instantly realize that you have entered a world that defies description. Exploration reveals hundreds of new discoveries that evoke a feeling of appreciation for the natural beauty around you. Only photographs can convey your exhilaration to friends back home. Whether you are a novice or an advanced diver you won't want to miss any of the incredible details of a coral reef. You will want the best camera system in the world for this job.

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viewfinder with LED exposure information and the most accurate light meter ever in an underwater camera make taking pictures easy and rewarding.

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sponges or the subtle markings of the multi-hued fish. You need an underwater flash—one that will record the natural tones of these spectacular colors at the proper exposure and give you even lighting coverage over the entire frame.

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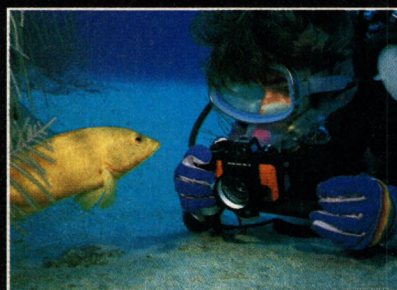
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Stewart Bakst is shown at left.

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SKIN DIVER MAGAZINE
1989
Bestseller
Series
MASKS, FINS
AND SNORKELS

Maxi Rondine: The name sounds like some sort of Olympic skiing competition or mass square dance—the former requiring speed and power, the latter requiring grace and style. And, those conceptions aren't too far off the mark. The Maxi Rondine from Cressi-sub is an attractive fin offering a powerful, graceful kick that propels the diver through the water with speed and ease.

Cressi-sub of Italy has been a major producer of diving equipment around the world for more than 40 years, and the American branch, Cressi-sub USA, is an important force in the U.S. market. Cressi USA offers a full range of dive gear including regulators, gauges, masks, snorkels, spearguns, knives, gear bags and accessories. It offers a wide variety of fins from lightweight full foot styles to super long bladed adjustables. These come in a diverse array of colors and materials and many sizes.

The Maxi Rondine fin is the newest of the Cressi line. Second only to the Gara in length,

it is designed for the advanced recreational diver desiring a powerful fin that offers fluid motion and the most up to date comfort and convenience features. It is perfect for use in currents, for divers who cover a lot of territory underwater and for those carrying a lot of camera gear or game. And, while the Maxi Rondine certainly can be used for snorkeling by those with good leg strength, that might be like driving a Cadillac on a neighborhood paper route.

As with any fin, the soul and substance of the Maxi Rondine is its blade. It is made of semi-firm technology-

plastic for snappy propulsion. Measuring 14.5 inches from fin tip to the front of the footpocket and nine inches at its widest point (large model), this is a large blade—not one for the casual kicker.

The blade has no vents. Many divers favor this design because, with the right motion, their downkick is not a mostly-resting stroke, but almost as powerful as the upkick. The blade is angled just enough to squeeze this extra power out of the downkick without creating too much resistance.

The blade has slight grooves to help channel water correctly over its surface

and has raised side ribs to enhance this. These side ribs support the blade firmly, yet allow it to flex just enough for the best propulsion and a snappy comeback.

The blade material reaches all the way under the footpocket to the heel of the fin, as do the side ribs. A broad band of this same material passes over the top of the footpocket. In this way, the fin is one firm unit from stem to stern and there is no hinge point to cause loss of power. The firm support also reduces the possibility of the diver using his/her toes excessively in the kicking motion, which could cause cramping.

The Maxi Rondine's footpocket is made of a soft technoplastic for comfort. It is bonded to the blade so well it's hard to find the seams. This

**HIGH
PERFORMANCE
FIN WITH A
RADICAL BLADE**

BY JIM WALKER
PHOTOGRAPHS BY BONNIE J. CARDONE

The Maxi Rondine fin features a large, powerful blade and extra support both under and over the footpocket. The buckles have a rugged clamping mechanism and swivel for individual positioning of the heel strap.

COMPARISON OF CRESSI-SUB ADJUSTABLE HEEL DIVE FINS

Model	Length	Blade Vents	Blade Material	Footpocket Material	Floating	Colors	Sizes	Price	Comments
Maxi Rondine	26.5"	No	Technoplastic	Soft technoplastic	No	Black, blue*	S,M,L,XL	\$92	A large, powerful fin for the advanced recreational diver.
Rondine Gamma	21"	Yes	Technoplastic	Soft technoplastic	No	Black, blue, yellow**, pink***	S,M,L,XL	\$55	A medium size fin for general recreational diving. Available in several colors to complement other gear.
Rondine Gara	32"	No	Technoplastic (blade is replaceable)	Black rubber	No	Black, yellow	One size	\$115	An extremely long fin for competition swimming, spearfishing, diving in currents.

*Except for yellow Gara, all non-black fins have translucent blades. **Available in S,M,L. ***Available in S,M.

patented bonding is so secure, the fin carries a lifetime warranty against separation. There are two drain holes at the toe and a high heel opening to make slipping the fin on the foot easy.

The fin's heel strap is made of the same material as the footpocket. This allows it to stretch when tightened, holding the foot securely in the pocket, even as a neoprene bootie compresses at depth. The strap has angled


ridges that prevent it from loosening accidentally. The strap also has a ribbed pull tab to allow the diver to pull it up over his/her heel easily even when wearing gloves.

The Maxi Rondine features plastic buckles that swivel to allow individual positioning of the heel strap. These also allow the strap to be moved down and then back up after the diver's foot has been inserted in the pocket. The buckles are streamlined to reduce the chance of entanglement in

kelp, etc. They incorporate plastic rollers and ribbed pinch clamps. When a clamp is open, the strap can be pulled easily in either direction. When it is closed, the strap is locked securely in place.

The Maxi Rondine fin is available in small, medium, large and extra large for \$92. It comes in two color combinations: a black footpocket and opaque black blade or blue footpocket and translucent

blade with a slight blue tint. The Maxi Rondine and a full line of adjustable heel or full foot fins are available at your Cressi-sub dealer. For the location of the dealer nearest you contact Cressi-sub USA, Inc., 10 Reuten Drive, Closter, NJ 07624; (201) 784-1005.

Cressi's Maxi Rondine fin—you should get a big kick out of it! 



The Maxi Rondine is available with a blue footpocket/translucent blade or in black/black.

WRECK FACTS

New York's USS San Diego

BY DANIEL T. BERG

When I first learned to dive and started to explore shipwrecks off Long Island and New Jersey, I dreamed of finding a porthole. This would surely be one of the finest artifacts possible. Eleven years later, finding a porthole still ranks high on my list of dive objectives.

The first porthole I recovered was while on my honeymoon in Hawaii. I was diving off the island of Kauai on the wreck of the *Luffenbach*, a WW II freighter. There, in front of me, in only 30 feet of water, was an intact porthole. I simply knocked off the four dogs and brought up the swing plate (or door as it is commonly called). After this I was lucky enough to find a porthole on the USS *San Diego*. This porthole seemed to be sitting in the sand just waiting for a liftbag to bring it to the surface. Over the next few years I recovered some small portholes on beach dives, a swing plate from the *Coimbra*, a WW II tanker sunk in 180 feet of water, and at least five portholes from an unidentified wooden wreck off Long Island. All in all I was quite lucky, especially since most of my portholes were easily recovered with only a small amount of work. This was soon to change.

The USS *San Diego* is one of Long Island's premier dive sites. Originally commissioned the *California* in 1907, she was launched on April 28, 1904, by Union Iron Works in San Francisco. She was 503'1" wide and had a displacement of 13,680 tons. On September 1, 1914 she was renamed *San Diego* and served as the flagship for our Pacific Fleet. On July 19, 1918 she was sailing from Portsmouth to New York when an explosion from a German surface mine tore a huge hole in her amidships. Soon after, two more explosions ripped through her hull. The *San Diego* sank within 28 minutes. Six of her

crew members were killed.

Today, the *San Diego* lies upside down in 110 feet of water, 12 miles from Fire Island Inlet. She supports a huge array of fish life. Divers of different levels, from novice to experienced, can always find something of interest, including such artifacts as cage lamps, brass valves, china dishes, silverware and even portholes.

In August of 1985 Bill Campbell and I were diving around the stern of the *San Diego*. As we swam into a washout I noticed some brass that was almost completely covered by sand. We both dug it out and were pleased to find it was a porthole backing plate. In other words, it was missing the glass swing plate and brass storm cover. Bill swam away, but I decided to recover the backing plate, figuring I'd have a nice artifact. Unclipping a 250 pound liftbag from my BC, I quickly rigged a line and started to fill the bag.

As the liftbag filled I was amazed at how little my artifact moved. In fact it didn't move at all and the bag was soon overflowing with air. I signaled Bill, who quickly came over and offered his 250 pound liftbag. Within minutes Bill's bag was rigged and we found the sand under us starting to move. The rim (a piece of brass weighing no more than 20 pounds) was still firmly attached to a huge steel plate weighing somewhere between 300 and 400 pounds. We sent the whole thing to the surface on an upline. An upline prevents artifacts from drifting away during a diver's ascent and also provides a safety decompression hang. When Bill and I climbed back aboard the *Wahoo*, the normally friendly crew informed me that my upline had snapped and the mate had to swim out and secure a line to my drifting bag. It took five of them to haul the artifact onto the *Wahoo's* swim platform, and I

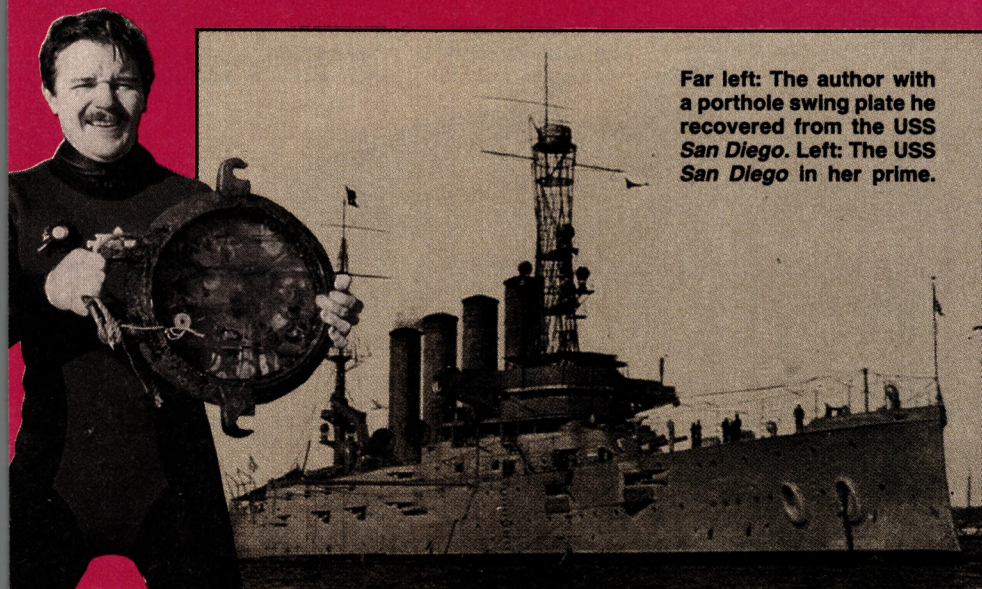
now owed them all a drink. This was a good deal considering I still needed help getting this piece of steel into my truck.

Once at home, I tried to separate the porthole rim, which was firmly bolted to solid steel. This, in itself, was no easy matter, and after many nights of pounding, prying and chiseling, I realized I was getting nowhere. The owner of a local gas station came to my assistance and, using his air tools, loosened the brass bolts that had been threaded directly into the steel plate. I returned home and stored the rim in my backyard.

During my next few visits to the *San Diego* I covered as much ground as possible, hoping to find some missing parts. While swimming along the outside of the hull I found what I was looking for, an intact porthole. Its glass wasn't even cracked. All I had to do was find a way into the wreck, drive the hinge pin out and the porthole would be freed. I swam aft and found an opening that led into the admiral's quarters. This was an area heavily trafficked by sport divers, so I couldn't imagine how a porthole would have remained untouched. After penetrating the wreck, I followed a row of porthole openings and then came to a wall. Since I thought I had gone too far anyway, I went back, dropped down to the next deck and did the same thing. Still no sign of any intact glass. Retreating once again, and swimming up two decks to repeat my procedure, I still found no sign of this elusive treasure. Now, out of time and running low on air, I exited the wreck and cruised back over the porthole. It was a mere 15 feet from the admiral's quarters opening, but was somehow hidden inside the wreck's rusting interior.

Two weeks passed before I was able to return to the *San Diego*. This time I measured the distance from the porthole to the opening by counting body lengths. This was repeated on the inside of the wreck with no better results than I had gotten two weeks earlier. On the second dive of the day I approached my dilemma a little differently. Outside on the hull, just above the porthole, I noticed a corroded hole. About the size of a dime, it went through the *San Diego's* outer hull. With a sledge hammer and a chisel I enlarged this hole to about the size of a fist. Once again I penetrated the interior, not looking for the porthole, but for the location hole. When I found it I knew what had gone wrong. Owing to the angle on which the wreck was resting and the amount of silt and debris piled up, much of the interior wall was buried. I had been swimming

photo/Steve Bielenda



Far left: The author with a porthole swing plate he recovered from the USS *San Diego*. Left: The USS *San Diego* in her prime.

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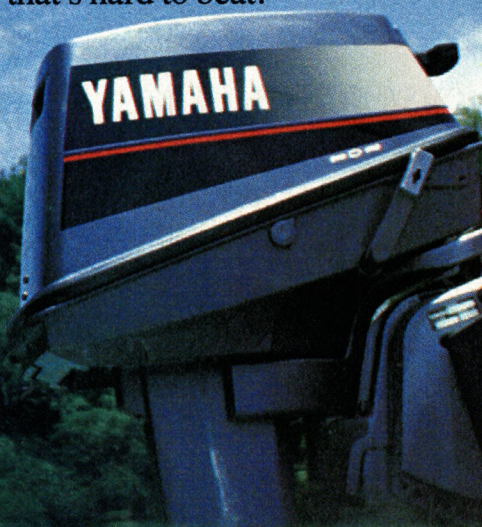
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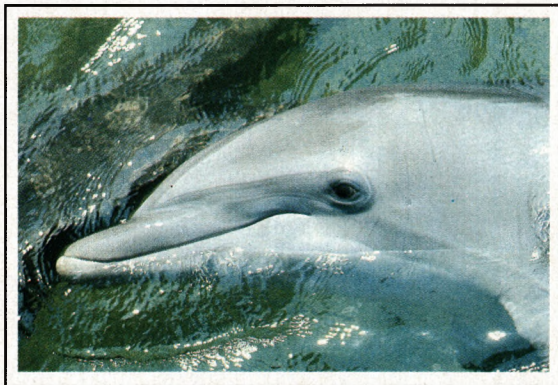
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WRECK FACTS

over the porthole.

On the next visit to the wreck I dug out enough debris to see the top rim. Fortunately, because the *San Diego* is upside down, the hinge pin was on top and within easy reach. However, I soon found there was absolutely no room to work. Right next to the rim on both sides were steel beams preventing any type of hammer swing. By this time I was fed up, but still very determined. I studied the size and shape of the rim's hinge at home and designed a metal pin pusher that could drop over the rim and, by means of a bolt and ratchet wrench, drive out the pin while still working within the confined quarters determined by the beams. I made this new device over the winter and eagerly waited to reap its benefits. "Mind over matter" was my new motto. This, of course, didn't come close to working. My dive buddy Rick Schwarz almost died of laughter as he watched my engineering masterpiece crumble in my hands. The hinge pin didn't have the courtesy to budge even slightly from position.

On most of my dives in 1986 I explored other shipwrecks. When I did visit the *San Diego* I could not motivate myself enough to even think about working on that porthole. I was also preoccupied with filming a documentary on the history of the *San Diego*, so much time was spent with the video camera, filming different areas of this huge wreck. Toward the end of the summer I once again planned to retrieve the porthole. This time I welded a small drive pin to a long crooked handle made from a bent shaft. The idea was that the drive pin could be held in position with my left hand out of the way and hopefully leave enough room to take small taps with a hammer. Although this new tool was made and stored with my dive gear, for one reason or another it wasn't used until the summer of '87.

I had gone on a diving vacation to Bonaire with my wife Denise, and when I returned, my good friend Captain Steve Bielenda informed me that while I was away a group of divers had located a storage room in the bow of the *San Diego* that was filled with china dishes. He said some beautiful pieces had been brought up. He was now running special trips to the *San Diego* and anchoring above the china hole, so I signed up for as many trips as possible. On one trip we anchored in the stern and since I didn't feel like swimming to the bow because of a very strong current, I decided this would be the perfect time for one last try at that stubborn porthole. Five minutes into the dive I had dug out a pit that exposed the top half of the frame. After 15 minutes the hinge pin was out. I thought to myself, this is too easy. Deciding to wait until the sec-

(Continued on Page 19)

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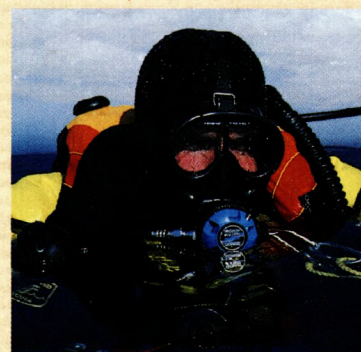
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WRECK FACTS

(Continued from Page 18)

ond dive I ascended to the *Wahoo* and impatiently waited out my surface interval. I proudly boasted to all on board that it should only take another 10 minutes of bottom time for my liftbag, carrying the porthole, to hit the surface. After a three hour interval I suited up and was all ready for a nice, easy retrieval. After doing a giant stride entry I immediately realized this was not to be the case. Sometime during my topside time I had managed to slice a big hole in the left shin of my drysuit and it flooded with ice cold water instantly. Once again I had nothing to show for my efforts.

All of the following week I worried that someone else who dove the wreck would easily recover what I had worked so hard for. On Thursday when I returned, the *Wahoo* was anchoring on the bow, so divers could head to the china room. This was great for everyone else, but I had to go to the stern, which was 450 feet up current. With a Tekna propulsion vehicle I calculated 5 minutes to travel astern, another 15 minutes to remove and send up my liftbag containing the swing plate and then 5 more minutes to return to the bow and ascend on the anchor line. All went as I had planned. Within 4 minutes I had my hand on the swing plate, but it wasn't moving. Digging down in the mud I found two bolts (dogs) securing the swing plate. Although I was able to quickly loosen them it still wouldn't budge. Removing my crow bar from its position on my back I tried to pry it loose. Twenty minutes later, after digging more debris away and breaking the seal, all my efforts were finally rewarded. As I climbed back onto the *Wahoo* I anxiously asked if my liftbag had come up. Don Schnell, the first mate, supplied the answer by pointing. About 500 feet away was my yellow liftbag, floating high in the calm sea. Even on the surface this porthole was giving me grief. Exhausted from all my hard work, I had to jump in the water once again and retrieve my bag and porthole.

With more than 15 dives tied up in one artifact, I asked myself, was it worth it? I can only answer that by saying that I have found another intact porthole on the *San Diego* and am now in the process of devising a plan for retrieval. I can only hope this one will be a little easier! 🐙

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Unless you've been in an underwater habitat for the last few years, you must have noticed dive gear has become as varied and valuable as items in a Rodeo Drive gift shoppe. And, divers naturally expect to tote such gear in style. But, here is where you have to be careful: There are many attractive bags available that only look as if they'd be good for diver purposes. These bags won't last long doing the job or won't do it at all. With this in mind, Wenoka Sea Style created the Designer Series of Dive-Pacs. The Designer Series bags not only complement your high tech, high color gear, they are specifically designed to organize and protect it. The Combi Bac-Pac, the largest bag in the Designer Series, even makes your load easier to manage. The best of burdens, the Combi lets you backpack your dive gear.

The Combi Bac-Pac's main compartment measures 25 x 17 x 11 inches, which translates to a spacious 4,675 cubic inches (2.7 cubic feet) of storage space. The bag is made of ultra tough Z-Tex fabric, an 840 denier weave of nylon backed by polyurethane. Seams are double sewn and stress points are box stitched for strength. When I strapped our test Combi on, I could immediately feel the quality of its construction.

The overall color of the Combi Bac-Pac (as with all the Designer Series bags) is rich charcoal gray, with sewn-in red piping and a high luster gray panel (with marine flag logo) for color accents.

The Combi's smaller chamber measures 21.5 x 15 x 3.5 inches and is sewn to the main body of the bag. This chamber offers an additional 1,128 cubic inches (.65 cubic foot) of storage space, which is accessed through a YKK nylon zipper (with tandem slides) that reaches around its upper half. A built-in double layer of closed cell foam padding on the outside of the chamber protects gear within and a similar layer of padding separates the two compartments. This chamber is perfect for items you want to keep away from heavy, wet gear. You can also carry a change of clothes in it or perhaps a pillow for use on an overnighiter. I was even able to fit my brief case in this chamber! (A dive club trip coordinator might appreciate this latter.)

The main compartment of the Combi Bac-Pac is also accessed through a YKK nylon zipper with tandem tabs and inside it has several added features. There are three clips at one end (that can be used for holding keys and the accessory bag that comes standard with the Combi Bac-Pac); a sheet of Z-Tex that serves as a partition (for separating your fins from other gear); a plastic support to strengthen the bottom of the bag; and adjustable quick-release nylon webbing restraining straps. These straps could save you the embarrassment of having your gear spill

out on a crowded boat deck just when you're trying to maintain a cool, dive-masterly air.

The Combi Bac-Pac's shoulder straps have 2.5 inch wide sections of padding sewn on for comfort. The straps are easily adjusted for individual positioning and have quick-release Delrin buckles. The shoulder straps can be stored out of the way in a special zippered slot. The hide-away straps are a great idea: Loose luggage straps have been known to catch on airport conveyor belts, causing four alarm pileups.

As mentioned, the Combi Bac-Pac comes with an accessory bag that measures 12 x 7 x 4.5 inches. This bag features two D-rings on top that attach to two of the clips inside the main chamber of the Combi. The accessory bag has a YKK nylon top zipper and is padded on all sides. In the accessory bag you can store small fragile gear such as your glasses or a Nikonos camera (without strobe) or your toothbrush and other overnight items (a perfect little ditty bag for

SKIN DIVER MAGAZINE
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ACCESSORIES

nondiving use). You could even keep a couple sodas insulated and cold in the bag on a beach trip.

There is a third clip inside the Combi that can be used to secure your keys or an optional Gauge-Pac. The Gauge-Pac is a thickly padded sleeve (12 x 7.5 inches) with a touch fastener closing top and one D-ring. The Gauge-Pac is perfect for storing valuable gauges and computers needing extra protection.

If you are going to use the Combi Bac-Pac you will have your hands free. If you need to keep those idle hands out of trouble, Wenoka



COMPARISON OF WENOKA SEA STYLE DESIGNER SERIES GEAR BAGS

Model	Style	Size	Fabric	Zippers	Compartments	Colors	Price	Comments
Combi Bac-Pac 1843-S	Backpack	25 x 17 x 11 in. 5,740 cu. in.	Z-Tex	4	2* padded front/back Strap slot	Lustrous black/gray	\$117.50	Full size gear bag for those who want the choice of hand carrying or backpacking. Padded, compartmentalized.
Overnight-Pac 1845-S	Carry bag	19 x 13 x 6 in. 2,109 cu. in.	Z-Tex	2	2, 1 padded Document slot	Lustrous black/gray	\$52.50	The perfect travel bag. Fully padded, will fit under an airline seat.
Regulator Brief 1847-S	Carry bag	15 x 11 x 5.5 in. 825 cu. in.	Z-Tex	2	Padded regulator chamber and partitioned logbook section	Lustrous black/gray	\$39.95	A compact multi-purpose bag. Fully padded to protect regulator and gauges. Has a separate briefcase style compartment for logbooks, etc.
RCE-Pac 1844-S	Carry bag	14 x 9 x 7 in. 882 cu. in.	Z-Tex	1	1 padded Document slot	Lustrous black/gray	\$33.95	The perfect size bag for regulator, camera gear, etc. Full padding protects and insulates.

* Combi Bac-Pac main compartment has divider

Sea Style can fill them with three other Designer Series bags, color matched to the Combi: The Overnight-Pac (19 x 13 x 6 inches) is a perfect carry-on bag with a padded, zippered main chamber and a zippered side pocket. The Regulator Brief Case (15 x 11 x 5.5 inches) is a padded multi-purpose bag with two zippered chambers. The Brief Case is ideal for carrying your regulator and logbooks, etc. The RCE-Pac (14 x 9 x 7 inches) has one large, fully padded compartment that is perfect for carrying camera gear (or a

picnic lunch you want kept cold).

If you're going to carry a gear bag, one of the easiest ways to transport it is on your back. But, there's an even easier method of transport—on a cart! The ATC-1 cart is specially designed for Wenoka Sea Style Dive-Pacs and is made of heavy wall aluminum tubing. The cart features large industrial-style wheels for durability and easy transport and has a 200 pound capacity. The Combi Bac-Pac slips over the ATC-1 and the cart can easily handle the Combi and two scuba

tanks or a stack of Dive-Pacs. The cart folds flat for storage.

The Combi Bac-Pac may be the answer to your gear transport problems. If it isn't, maybe the Combi and ATC-1 together will. There's bound to be a Wenoka Sea Style bag combination perfect for you. See them at your dive store—you can carry them out! For the address of the dealer nearest you contact Wenoka Sea Style, 1134 53rd Court North, P.O. Box 8238, West Palm Beach, FL 33407-0238; (407) 845-6155.

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Optional
ATC-1 cart.....\$99.95
Gauge-Pac.....\$8.75

Left: The Regulator Brief Case, Gauge-Pac and Accessory bag. The Accessory bag is only available with the Combi Bac-Pac.



BY JIM WALKER PHOTOGRAPHS BY BONNIE J. CARDONE



CACHALOT WHALE (*Physeter catodon*)

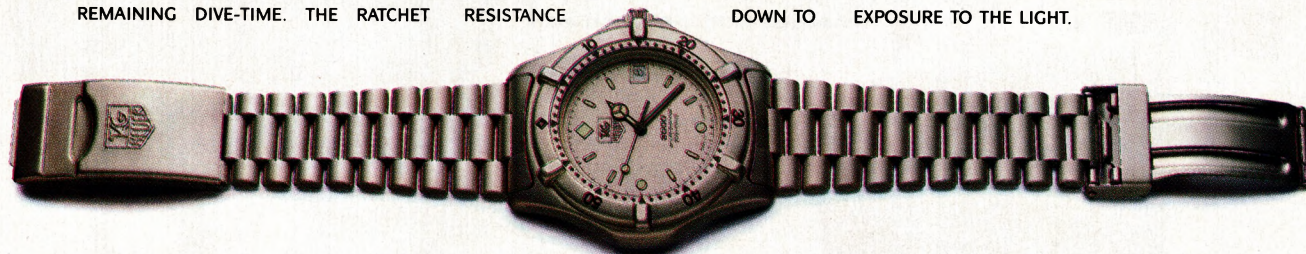
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Scuba Quiz

Category: Diving Emergencies

Topic: Accident Management
By Dennis Graver

Safe diving is no accident, but accidents can and do happen from time to time. You should be trained in first aid and CPR, but is that all you need to know? Find out what else you should know about accident management by answering the questions below. The answers are on the next page.

1. Dive boats and scuba instructors are *required* to have oxygen present for all paid diving activities.

- ☐ A. True
☐ B. False

2. A typical scuba regulator may be safely used with a standard oxygen cylinder.

- ☐ A. True
☐ B. False

3. The Trendelenberg position is recommended for diving accident victims.

- ☐ A. True
☐ B. False

4. Victims of decompression sickness should be administered two aspirin.

- ☐ A. True
☐ B. False

5. A victim of either air embolism or decompression sickness should not be allowed to drink fluids.

- ☐ A. True
☐ B. False

6. Only licensed medical personnel may legally administer oxygen in most states.

- ☐ A. True
☐ B. False

7. When a litter or basket is being lowered from a helicopter to a boat for the transfer of a victim, you should:

- ☐ A. Secure all items that can be blown away
☐ B. Clear the area of all unnecessary personnel
☐ C. Grab the litter ASAP to prevent damage to the vessel
☐ D. A and B, but not C

8. Attach a trail line to the litter or basket to stabilize it when a victim is being transferred to a helicopter.

- ☐ A. True
☐ B. False

9. Oxygen cannot be administered to a non-breathing victim except with a resuscitator.

- ☐ A. True
☐ B. False

10. Only EMTs and other licensed medical personnel may use positive pressure resuscitators.

- ☐ A. True
☐ B. False

11. Constant flow oxygen is of no value to a diving accident victim.

- ☐ A. True
☐ B. False

12. The ideal method of oxygen administration by non-EMT rescuers is _____.

- ☐ A. Constant flow
☐ B. Demand valve
☐ C. Nasal cannula
☐ D. Positive pressure

13. Oxygen units should be factory serviced every _____.

- ☐ A. Year
☐ B. Two to three years
☐ C. Three to four years
☐ D. Five years

14. Constant flow oxygen units can deliver up to _____ percent concentrations of oxygen.

- ☐ A. 16
☐ B. 25
☐ C. 60
☐ D. 100

15. At a flow rate of 10 liters per minute, an E cylinder of oxygen will last approximately:

- ☐ A. 15 minutes
☐ B. 35 minutes
☐ C. 70 minutes
☐ D. 5 hours

Scuba Quiz

Answers: Accident Management

1. B. False. It is highly recommended that diving professionals have oxygen available at all dive sites, but there is no requirement for it other than in Los Angeles County, California. Do not count on oxygen availability just because you dive on a professional dive boat or other commercial operation.

2. B. False. Not only is the yoke connection for an oxygen valve different than that of a scuba regulator, but special cleaning, O-rings, etc. are required because of the fire hazard associated with oxygen. Do not use oxygen equipment in the presence of oils, greases or flammables. When oxygen equipment is in use, smoking must not be allowed.

3. B. False. The Trendelenburg position was originally recommended for air embolism victims only to try to restore or improve circulation to the brain. Unfortunately, this position immediately induces cerebral edema and respiratory discomfort. The current positioning recommendations for diving accident victims are: 1. Place all victims supine (flat on the back). 2. If, based on diving history and the victim's symptoms you suspect cerebral air embolism, elevate only the victim's legs. If the victim gets worse, return the victim to a supine position. 3. If the victim becomes nauseated, turn him/her onto the left side in order to protect the airway.

4. B. False. Some medical authorities still advocate aspirin to act as an anticoagulant when the body's immune system reacts to the bubbles. Current thinking is that the aspirin may mask symptoms necessary for diagnosis. A nauseated victim may not be able to tolerate the aspirin. As a result, aspirin should not be administered.

5. B. False. U/W all divers become dehydrated. This situation can promote bubble formation and growth. The diver suffering from decompression sickness should be hydrated to expand the fluid volume. Ideally, the victim should be administered lactated Ringer's solution intravenously. In that absence, the victim may drink balanced fluids only if more than one hour away from medical

help and only as long as there is no nausea. Fluids such as half-strength Gatorade, given at the rate of four fluid ounces every 15 minutes, are ideal.

6. B. False. A recent survey sent to the health and safety officers of every state concludes that there are no regulations pertaining to the administration of oxygen to diving accident victims in most states. Do you know if there are any restrictions concerning administration in your state?

7. D. A and B, but not C. Secure all items that can be affected by the rotor down-blast, keep personnel to a minimum and do not touch anything lowered from a helicopter until it touches the ground or the deck to discharge any static electricity that may have resulted from the flight.

8. B. False. Unless you are specifically instructed to do so by the flight crew, do not secure a line to the litter. Otherwise, the line could be blown into one of the rotors and cause the helicopter to crash. The air crew may provide you with a weighted line with which to perform this action. Learn more about helicopter evacuations. Prior to the transfer, talk with the air crew to see if they want your vessel stationary or underway during the transfer.

9. B. False. Not many are familiar with the procedure of the rescuer breathing through a pocket mask connected to a minimum oxygen flow rate of 10 liters per minute, but it is a more effective procedure than standard mouth to mouth resuscitation. This mouth to mask resuscitation technique does not pose the liability concerns of the positive pressure demand valve technique.

10. A. True. The use of positive pressure resuscitators requires specialized training and should not be attempted by anyone not qualified to operate such a device.

11. B. False. Any concentration of oxygen greater than normal atmospheric concentration is somewhat helpful. Ideally, you want to administer 100 percent oxygen by demand valve from the time you recognize the accident until professional help arrives. Though less expensive, constant flow units are less effective and less efficient than the preferred demand valve.

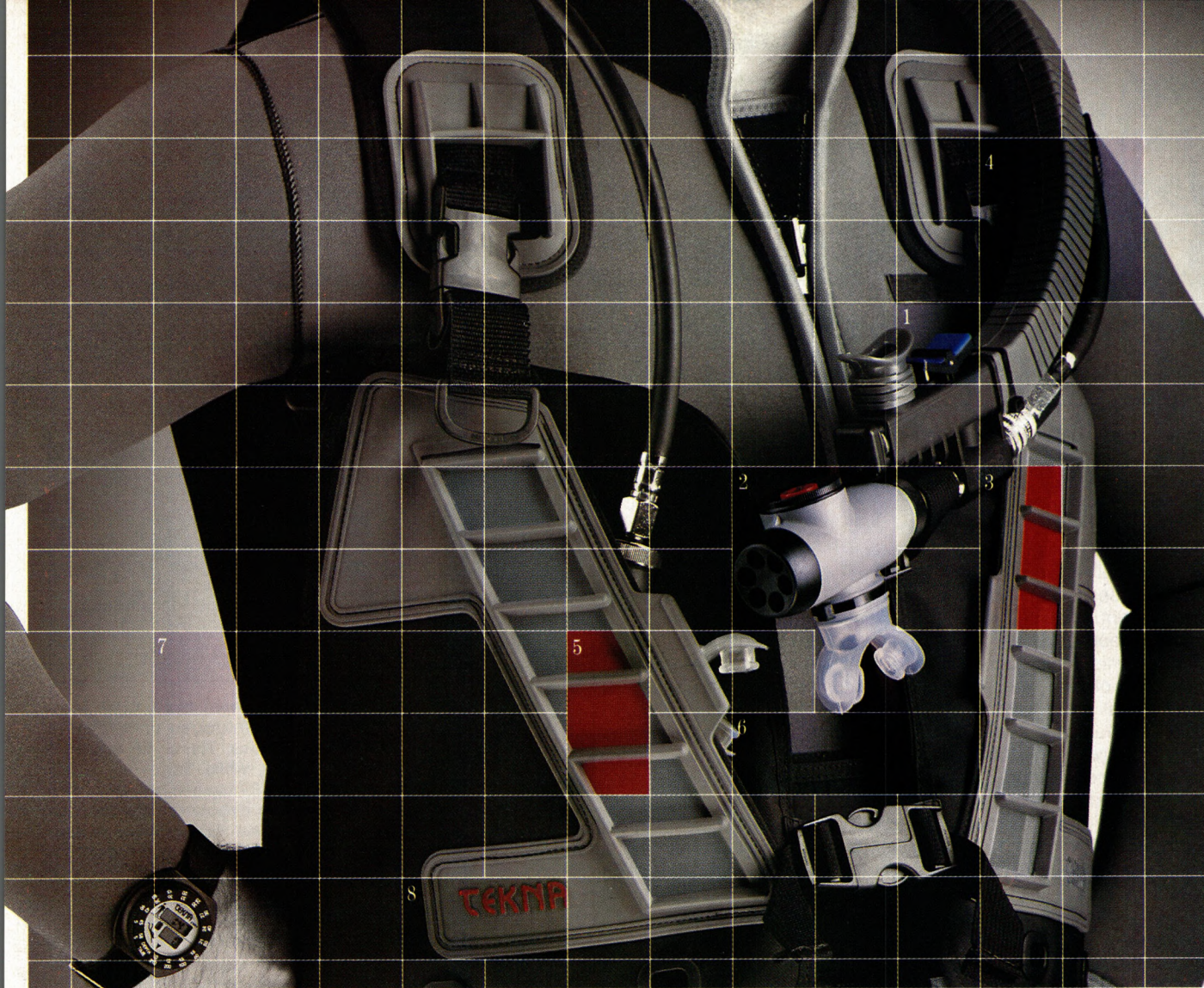
12. B. Demand Valve. A demand valve oxygen unit can deliver 100 percent oxygen to a patient while constant flow units are capable of only a little more than half that concentration. While more expensive, demand valve units are more effective, more efficient and are recommended.

13. B. Two to three years. Oxygen units should be tested every two months to ensure proper functioning and should receive factory-type service every two to three years. Oxygen units are seldom used and many owners may not remember how to operate them when the need arises. Familiarize yourself with your emergency equipment on a regular basis.

14. C. 60 percent. Constant flow units can deliver from 25 to 60 percent oxygen depending on the flow rate and the type of mask being used. A flow rate of 10 to 12 liters per minute using a non-rebreather type mask with a reservoir bag is recommended when this type of unit is used. In order for this mask to be effective, the victim's first inhalation must be from a reservoir bag that is fully inflated with oxygen.

15. C. 70 minutes. An E cylinder contains approximately 682 liters of oxygen when filled at standard pressure and temperature. Using a demand valve delivering 100 percent oxygen, this cylinder will last about 50 to 60 minutes. Using a constant flow mask to deliver about 60 percent oxygen at a rate of 10 liters per minute, the contents will be expended in 68.2 minutes. Smaller D cylinders contain approximately 415 liters of oxygen when properly filled and will deliver 30 to 40 minutes of oxygen by demand valve and would be empty after 41.5 minutes if delivering oxygen to a constant flow mask at 10 liters per minute.

Were you surprised by some of the answers to this month's quiz? Do you feel you need to know more about handling diving emergencies? Rescue courses, oxygen administration courses and EMT training are all valuable and should be considered. For specific training, contact your certification agency, the Diver's Alert Network (DAN), the National Association for Search and Rescue (NASAR) or the Undersea and Hyperbaric Medical Society (UHMS). Oxygen is invaluable for diving emergencies. You should have a proper, well serviced unit available at the dive site and know how to use it. Hopefully, you will never have an opportunity to manage an accident because diving is a very safe activity when people abide by the recommended safe practices.



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DIVING MEDICINE

The Medical Aspects Of Navy And Commercial Diving

In last month's column, we talked about U.S. Navy divers. This month I will continue the series on diving environments and their medical problems, focusing on the commercial diving environment. Both military and commercial diving have stringent medical requirements. These are established because of the often adverse environment in which these divers work. Unlike a sport diver who can choose the environment, including temperature, visibility, time of year, etc., the military and commercial diver must dive whenever and wherever he is needed.

Commercial diving has many aspects. There are commercial divers who are scuba trained for marine biology studies in good diving environments. There are divers who dive in large nuclear reactors to inspect and repair parts of the fuel reactor core. There are others who work in shallow dirty water in harbors, repairing docks, pilings, sea walls and other structures. They are usually surface supplied hardhat divers who work for many hours at shallow depths breathing air. We must consider the divers who do police rescue and search as commercial divers and those who fish for abalone are also commercial divers. By far the largest population of commercial divers are the ama of Japan and their counterparts in other Asian countries. These divers are often women free divers who harvest certain kinds of seaweed and shellfish.

The most interesting of the commercial divers are the deep saturation divers who live in pressure chambers for many days and travel to and from work in a diving bell. These divers are primarily involved in oil recovery from the deep oceans. There are subsea oil wells in the Gulf of Mexico, the North Sea, in the south Atlantic and in the Indo-Pacific.

Of course, if you are earning a living diving in any way you can be considered a commercial diver. This includes underwater photographers, diving instructors, archaeologists and marine scientists. We may see a new type of commercial diver appear (the U/W farmer) as aquaculture proliferates in the next few decades.

Much of the history of diving revolves around commercial diving. The equipment and knowledge we have today to use for sport diving evolved from many

early designs used in commercial or military diving. Self contained diving using compressed air was first done in the early 19th century. Scuba was long in coming because of the need for tanks capable of holding air at high pressures. The first "scuba tanks" were large open, inverted barrels of air that were lowered over the side of a ship and sunk with heavy ballast. Mobility was limited and the diver could only move in the vicinity of the barrel, breathing air trapped in it.

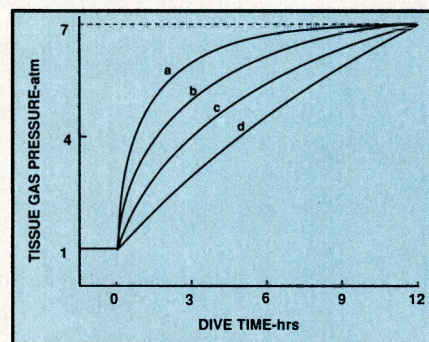
Today, commercial divers using surface supplied air maintain free access to our harbors and waterways by working as salvage divers to remove sunken debris. Many of these jobs are difficult and dangerous because of heavy currents, zero visibility and the complexities of the sunken object. Working inside a shipwreck in fast moving, cold water does not provide an enjoyable dive. There have been times when commercial divers salvaging an oil tanker found themselves diving in gasoline, which exploded when a welding torch was lit. An interesting salvage dive occurred in the Mediterranean several years ago. Divers had to salvage drums of lead additive for gasoline that went down with a cargo ship. The lead in the water could penetrate a diving suit and cause severe lead poisoning. Special diving suits and decontamination procedures had to be developed. Exposures such as these are extreme, and unlike those found in sport diving.

SATURATION DIVING

The most interesting commercial diving is saturation diving. It is necessary whenever depths exceed about 200 feet and there are many hours of underwater work. If you examine the air diving tables, you will see there is a severe penalty in decompression with deep dives. On air, for example, decompression times become impractical below 150 feet. Our sidebar shows decompression times for dives of one hour duration at various depths using air.

The table shows why saturation diving is a better choice when there is a prolonged diving job. At depths below 100 feet on a 60 minute dive more time is spent decompressing than on the bottom. Below 160 feet, decompression time is

By Alfred A. Bove, M.D., Ph.D.



DECOMPRESSION TIMES: 60 MINUTE DIVE

Depth (feet)	Time (min:sec)
100	38:40
120	71:00
140	97:20
160	132:40
180	152:50
200	199:20

Top: This graph shows the partial pressure for inert gas (nitrogen or helium) in four different tissues. Tissue (a) takes up gas most rapidly, while tissue (d) is the slowest to do so. All tissues are fully saturated at 12 hours exposure. **Above:** This chart shows why saturation diving is best in prolonged dives at deeper depths.

more than two hours for a one hour dive. At 200 feet, the decompression time is more than three hours for a one hour dive. If a job required 60 man-hours of work at 200 feet, the decompression time would be about 100 hours for 30 hours of bottom time. In order to avoid the bends, only one such dive can be made each day. Thus, the job would take 30 days with two divers. Saturation divers using helium to avoid narcosis and working at the same depth would live in a pressure chamber on a ship and descend to the work in a pressurized bell. Two divers working six hours a day each would take five days to complete the job and would require about 36 hours of decompression in the chamber. For most jobs of this type, saturation diving is more economical and less likely to cause the bends.

Why is this approach called saturation diving? Henry's law states that tissues take up gas in proportion to the partial pressure of the gas. So, when the diver enters the water and pressure increases, more gas will enter the tissues. The gases, however, do not enter tissues instantaneously. Different tissues need more or less time to equilibrate with the surrounding pressure. Although the times vary, after about 12 hours at the new pressure, all tissues will eventually become fully saturated. Once they are saturated, no more gas can go into the tissues at that

(Continued on Page 184)

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The Houston Underwater Club's Seaspace, a scuba diving symposium open to the public, is scheduled June 2 to 4, at the Hyatt Regency Hotel in Houston, Texas. This year, this nationally renowned exposition will be complemented by the NAUI International Conference on Underwater Education, known as IQ.

NAUI will host the Seaspace '89/NAUI IQ seminar sessions, marshalling the world's foremost authorities on diverse aspects of diving science and technology. Among the presenters is Dr. Glen H. Egstrom, recipient of the Diving Equipment Manufacturers Association Reaching Out award for achievement in diving safety and legislation. Dr. Egstrom will speak on "Tables vs. Computers—Controlling Decompression."

Scientist/diver Dr. Franz Meyer will report on "Reef Corals Under Attack: Can They Fight Back?" Divers will learn how to avoid actions that are damaging to corals as well as ways in which corals defend themselves from attack.

Many presentations will focus on interesting diving locations and marine life, such as Nobert Wu's "Rare and Unusual Fish." It includes photographs of juvenile whale sharks and pelagic swordfish. Wu will also be featured in the Seaspace Film Festival with two slide presentations, "Life in a Kelp Forest" and "Descent into the Maelstrom."

Other NAUI IQ seminar topics include an update on "The Female Role in Diving" by Dr. Tom Griffiths. A special report from Patricia St. John, a researcher working with dolphins and autistic children, is entitled "Educating a Wild Dolphin."

The Seaspace '89 Film Festival will continue its tradition of entertainment and

creativity with Stan Waterman, underwater photographer, film producer, explorer and another DEMA Reaching Out award recipient. Guaranteed to bring his patented brand of humor, romance, and excitement to the stage, Stan will share his latest film, *Sharks*.

Marty Snyderman, naturalist/cinematographer, will premiere his slide presentation "Moments" for the Seaspace audience. His recent work includes National Geographic Society documentaries and a series of underwater films for the BBC. A frequent contributor to numerous and diverse publications, Snyderman has filmed many episodes of Mutual of Omaha's *Wild Kingdom*.

Scuba divers travel widely, savoring the beauty of exotic dive sites around the world. Yet one of diving's most exciting experiences is available in the Texas Gulf of Mexico. Long-time Houston divers, Gary Rinn and Kenneth Young, have captured the excitement of an encounter with manta rays and a whale shark at the Flower Gardens Coral Reef, 110 miles from Galveston. Their superb video footage, synchronized with a compendium of slides produced by the Houston U/W Photographic Society, will conclude the Film Festival with "Texas Sleigh Ride."

Seaspace's 150 booth exhibit hall, open free to the public, will feature the latest in diving equipment, travel and U/W photography. Attractions include demonstrations and style shows, exhibitor's seminars, an U/W photo gallery and an interpretive display of marine life designed especially for children.

Tom and Patti Mount, celebrated authors and photographers, will conduct an intensive, day-long investigation of the

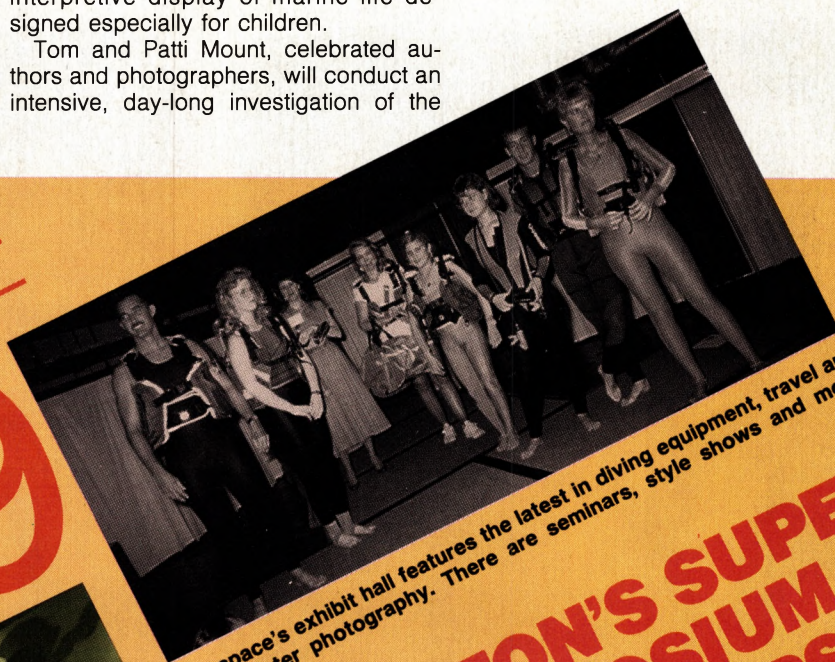
techniques specific to photographing models underwater. The Mounts have recently developed an underwater modeling specialty course for NAUI. Attendance at their instructional presentation will be limited and advance registration is strongly advised.

For newcomers to the sport, Seaspace '89 offers an introduction to coral reefs and a free introduction to scuba. Certified divers are invited to compete for prizes and accolades in the Seaspace International Underwater Photographic Competition or join in a Flower Gardens dive trip sponsored by Houston Underwater Club and International Divers Club. First time visitors to Houston may also partake of a Seaspace sponsored trip to NASA's Johnson Space Center.

The overriding goal of Seaspace is educating the public to the beauty and importance of our underwater environment. The proceeds of Seaspace are placed in a permanent educational trust funding a marine related scholarship program. Public support enables the Houston Underwater Club to provide scholarships and financial support to students engaged in college and post graduate studies in the marine sciences. In 1989, Seaspace will award \$9,000 in grants to students of marine sciences.

For further information, tickets and photo contest entry forms, please write Seaspace '89, P.O. Box 3753, Houston, Texas 77253-3753 or call (713) 467-6675. ✕

SEASPACE '89



Seaspace's exhibit hall features the latest in diving equipment, travel and underwater photography. There are seminars, style shows and more.

HOUSTON'S SUPER SYMPOSIUM FOR DIVERS

BY KENNETH D. KNEZICK



TECHNIFACTS

By E.R. Cross



In many areas the month of May is a period of transition in diving. It is no longer winter but still is not summer. If you haven't kept your dive gear, *all of it*, in good repair during the winter months, now is the time to see that it is ready for summer fun. Also, now is an excellent time to re-read recent issues of SKIN DIVER to see what new equipment has come on the market. Then visit the dive shops. Replace any doubtful equipment or upgrade your outfit.

In connection with upgrading diving safety think about your personal health and physical condition. Are you ready for a summer of fun underwater? If you can't quit, cut down on the use of tobacco products. The same goes for liquor and other harmful substances. It's a little late

for a complete physical condition upgrade but some concentrated conditioning will help make the summer fun just that—fun.

QUESTIONS ABOUT PAST TECHNIFACTS

Referring to the December 1988 Technifacts about diving during thunderstorms, a reader asked, "I know there is a way to tell how far away a thunderstorm is by timing the difference between seeing the lightning and hearing the thunder . . . Will you explain this?"

We pointed out that the noise of thunder travels at the speed of sound in air, about 1,120 feet per second. This is roughly five seconds per mile (actually just more than 4.7 seconds per mile). We

also pointed out that the image of lightning travels at the speed of light. For practical purposes we see lightning as it occurs. Therefore, when you see the flash, count the seconds until the thunder is heard. Multiply the seconds by 1,120 and you have the distance in feet to the source of the thunder. You can make a quick estimate by figuring the flash is one mile away for every five seconds between the time you see it and hear its thunder. Count and-one, and-two, etc., for each second. With a little practice you can come close enough to stay safe.

Another reader wanted to know what effect the atmospheric noise of a thunderstorm might have on radio communications as related to boating and diving.

Atmospheric noise is the sounds heard

The Buckingham Wife Company, N.Y. © 1988. 40% Alc. by Vol.



He knew then, after the music, the dancing, and the long, long, conversations over B&B, that

during radio reception owing to atmospheric interference. This is also known as atmospherics or 'sferics and is the result of electromagnetic radiation from lightning or other electrical disturbances.

Atmospheric noise owing to thunderstorms will probably not have much effect on radio reception during pre-dive planning since divers will likely still be quite some distance from the dive area and any storms that may be present there. However, while still in the planning stages, divers and boaters should listen to all available weather reports on TV, conventional radio and marine channels or scanners. If thunderstorms and related adverse weather patterns are reported or predicted, plan the dive in areas free of electrical disturbances.

When in the immediate vicinity of thunderstorms, atmospherics can make radio reception almost impossible. If diving and boating safety depends on the use of the radio, your security will be threatened. Also keep in mind that a radio antenna—and the radio—are potential points of extreme danger during an electrical storm. Antennas should be disconnected from radios during passage of a thunderstorm.

Not weather, but weather related, are tidal conditions. In a recent *Technifacts* a reader wrote about living so far from the ocean that no knowledge of tidal conditions could be had until at the dive site. Sometimes these were not conducive to

safe diving. Computer buffs can now work up tidal data on their PCs. Two programs are available.

For the Macintosh PC, Nautisoft Inc., P.O. Box 282, Rockland, DE 19732, has developed MacTides2.0. This program computes and quickly and accurately predicts both tide height and tidal current for 5,400 locations in the U.S. for any year up to 2010. There are many file building features. Discs are available for both the East Coast (4) and the West Coast (1). Requirements are a 512k Mac with DS drive, MacPlus, SE and Mac II. Other useful information can be obtained from this program such as maximum ebb and flood, slacks, and directions of tides; rotary current plots; daily and monthly plots; and more.

There is also help for IBM and IBM compatible users. Micronautics, Inc., 70 Zoe Street, Suite 200, San Francisco, CA 94104, has developed the Tide.1 Rise and Fall system for 3,200 coastal locations in North America. This program accurately plots a daily tidal curve on the screen, thus eliminating error prone table references. Special features of the program include high and low tides, sunrise and sunset, tide calendars and daily tidal plot. It has several printer and file formats. Users can have a choice of seven regions for predictions, including New York/New England; Mid-Atlantic Coast; Southeast/Gulf Coasts; Pacific Coast/

Hawaii; Central America/Caribbean; Alaska/British Columbia; and East Coast/Canada.

These programs cost from \$100 to \$200. Interested divers, boaters, fishermen and others concerned with tides and related phenomena should write direct to the companies for further information.

The *Bountys* of the several *Mutiny on the Bounty* films continue to haunt me. I thought we had put them all to rest a few months ago (October 1988) but I've recently received some interesting and helpful information from seaman/diver/historian S. G. "Spud" Roscoe of Arm-dale, Nova Scotia. Spud says, "The remains of the original *Bounty* lie on the bottom of Bounty Bay, Pitcairn Island in the South Pacific, where she sank after being scuttled and set on fire by the original mutineers in 1789." [Note: Mutiny of the crew occurred in mid-1789 but the *Bounty* was not scuttled and burned at Pitcairn Island until the spring of 1790.]

Bounty number two Spud says, "Lies at the Long Beach, California, breakwater. She was a converted yacht and was used in the film starring Charleton Heston and Clark Gable in the 1930s."

About *Bounty* number three Spud says, "This is my *Bounty*. It was built here in Nova Scotia in the same building as the famous fishing schooner *Bluenose*, which is depicted on the Canadian ten (Continued on Page 178)




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**A THREE PIECE
OUTFIT FOR
WARM OR COLD
WATER DIVING****TEXT AND PHOTOGRAPHY BY
BONNIE J. CARDONE**

Extraordinarily versatile: These two words describe Harvey's Reversible Fun Set wetsuit better than any others I can think of. The Fun Set package consists of a one piece jumpsuit and a tank top shorty. There is also a vest with attached hood, sold separately. You can wear each alone, any two at the same time or all three together. Each garment is reversible. Thus, each has two entirely different color schemes.

The Reversible Fun Set is Harvey's top of the line wetsuit. For 32 years Harvey's has focused its energy on making neoprene watersports apparel—wetsuits, drysuits, swimsuits and accessories such as hoods, booties and gloves. You would expect a company that's been concentrating on such items for so many years to have excellent products and this is certainly the case. Let's take a closer look at the Reversible Fun Set wetsuit.

A Fun Set wardrobe begins with a full length jumpsuit. It has a YKK nylon zipper down the front for ease of donning; raglan sleeves for a good fit and ease of movement; a "banana" collar for comfort; kneepads for protection; and stretchy Lycra edge trim so there are never any rough edges. As with the other Fun Set garments, all of the seams on the jumpsuit are triple glued and sewn for strength and watertight integrity.

The jumpsuit is fashioned of Soft-

HARVEY'S
REVERSIBLE FUN SET WETSUIT

Top: Jane Ellis and Brian Heldsiek in the Fun Set tank top shorty and jumpsuit. **Right:** Brian's suit reverses to navy/red. **Far right:** Jane wears the hooded vest. It reverses to black/teal from charcoal/pink.

COMPARISON OF HARVEY'S WETSUITS

Model	Material	Thick- ness	Colors	Standard Features	Custom/ Stock	Suggested Retail Price	Comments
FUN SET SERIES							
Reversible Fun Set	*Softstretch/ nylon II	1/8" 3/16" 1/4"	**Navy/red—royal/yellow **Black/red—charcoal/yellow ***Royal/pink—navy/teal ***Black/teal—charcoal/pink	Kneepads, Lycra edge trim	Both	\$325 \$342 \$370	Includes one piece jumpsuit/tank top shorty. Hooded vest available separately. All pieces also available separately.
Deluxe Fun Set	Softstretch/ nylon II	1/8" 3/16" 1/4"	All colors	Kneepads, Lycra edge trim	Both	\$296 \$312 \$340	Same design as Reversible but does not reverse. Includes jumpsuit/tank top shorty. Hooded vest available separately. All pieces available separately.
DESIGNER SERIES							
Sundance	Softstretch/ nylon II	1/8" 3/16" 1/4"	****All colors	Kneepads, edge trim	Both	\$316/323 \$333/340 \$349/356	Available either with beavertail or step-through jacket. Women's model has French-cut legs.
Super Reef	Softstretch/ nylon II	1/8" 3/16" 1/4"	****All colors	Kneepads, Lycra edge trim	Both	\$223/267 \$243/287 \$266/310	Available either with waist high or farmer john pants. Step-through jacket.
CONTINENTAL STEP-IN SERIES							
Master Diver	Softstretch/ nylon II	3/16" 1/4"	****All colors	Silver plush lining, satin binding	Both	\$310 \$332	Step-in jacket with diagonal zipper. Men's suit has surf-style legs, women's has French-cut. Farmer John pants.
Floral Reef	Softstretch Lycra II	1/8" 3/16" 1/4"	Blue	Kneepads, Lycra edge trim	Both	\$300 \$318 \$337	Women's model only. Two-tone floral panels on step-in jacket with French-cut legs. Farmer john pants.
PACIFIC SERIES							
Hightide	Softstretch/ nylon II	1/8" 3/16" 1/4"	All colors	Kneepads nickle-plated twist-locks	Both	\$242 \$262 \$284	Jacket with beavertail, farmer john pants. Most popular Harvey's model.
Argonaut I	Softstretch/ nylon I	1/4"	All colors	Nickle-plated twist-locks	Both	\$262	Jacket has attached hood and inverted, 3/4 length zipper. Waist high pants.
Argonaut II	Softstretch/ nylon II	3/16" 1/4"	All colors	Kneepads, nickle-plated twist-locks	Both	\$282 \$304	Jacket has attached hood and full length zipper. Farmer john pants.
SPORT SERIES							
Sport Diver	Neoprene/ nylon I	3/16" 1/4"	Black	Textured neoprene, nickle-plated twist-locks	Both	\$163/203 \$179/219	Available with high waist or farmer john pants. One zipper, beavertail jacket. A Harvey's original.
Pacific Sport Diver	Softstretch nylon II	1/8" 3/16" 1/4"	All colors	Nickle-plated twist-locks	Both	\$182 \$202 \$224	High waist pants, beavertail jacket, one zipper. A Harvey's original.
Pacific Jumpsuit	Softstretch/ nylon II	1/8" 3/16" 1/4"	All colors	Nylon zipper	Both	\$168 \$190 \$204	One piece suit with full length arms and legs, one full length zipper.

* Harvey's exclusive four-way stretch neoprene ** Men's *** Women's **** Some colors cost extra

stretch, a special, four way stretch neoprene used exclusively by Harvey's. The jumpsuit's basic color is complimented by stripes and panels of another color.

The kneepads deserve special mention. Sewn into the suit so they are an integral part of it, the kneepads are "pressed." They provide freedom of movement and protection without bulk.

The second part of the Reversible Fun Set wardrobe is the tank top shorty. This one piece garment is sleeveless and has short legs. There is a touch fastener closure on the left shoulder. The torso is one color, the stripes running down the sides are another. The tank top shorty is also reversible. It can be worn alone in warm water or under the jumpsuit for additional warmth in cold water. All of the edges of the shorty are trimmed with Lycra and there is an additional panel in the crotch for comfort and ease of movement.

The final part of a Reversible Fun Set wardrobe is the vest with attached hood. This garment is brand new for '89. It consists of either a 1/8 inch vest with 3/16 inch

hood or a 3/16 inch vest with 1/4 inch hood. The vest is sleeveless and covers the entire torso. The hood has an extra panel under the chin and in the middle of the top to improve the fit and comfort. All edges are finished with stretchy seam tape. Of course, as with the other pieces described thus far, the hooded vest is reversible. It is designed to be worn under the jumpsuit for especially cold conditions but could also be worn over or under the tank top shorty.

The Reversible Fun Set wetsuit wardrobe is available in three thicknesses: 1/8, 3/16 and 1/4 inch Softstretch nylon II. (Nylon II means there is nylon bonded to the neoprene both inside and out.) The 1/8 inch jumpsuit/shorty package has a suggested retail price of just \$325. In 3/16 inch Softstretch the price is \$342; in 1/4 inch it is \$370. Each of the garments is also available separately, so extras can be ordered: You might want two thicknesses of the tank top shorty (one for warm water, one for cold) or both versions of the hooded vest. The 1/8 inch vest retails for

\$75; the 3/16 vest is \$79.

No other wetsuit we have seen offers such extraordinary versatility. The Reversible Fun Set comes in stock sizes and can also be custom made to fit you.

The men's Reversible Fun Set comes in navy with red, reversing to royal with yellow; or black with red, reversing to charcoal with yellow. The women's version comes in royal with pink, reversing to navy with teal; or black with teal, reversing to charcoal with pink. Custom colors are available but cost extra.

Like the concept of mixing and matching but don't need a reversible wetsuit? Harvey's has that covered, too. The Deluxe Fun Set has all the features of the Reversible but does not reverse: i.e., it can only be worn with one side out. It costs slightly less than the reversible and is available in a rainbow of colors.

You can see the Reversible Fun Set wetsuit at your nearest Harvey's dealer. Or, for a 24 page, full color 1989 catalogue, send \$2 to Harvey's Skin Diving, 2505 S. 252nd, Kent, WA 98032.

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DIVERVISION



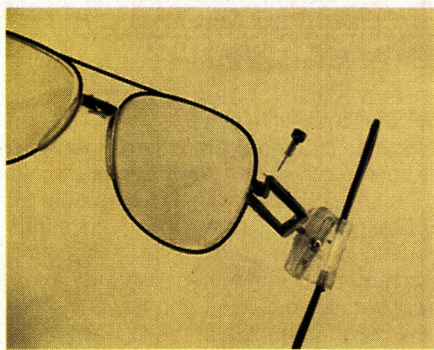
**Install Your Eyeglasses
In Your Dive Mask**

BY JIM WALKER

Do you have trouble distinguishing a sea lion from your dive buddy or your depth gauge from your compass underwater? Have you been suffering along, wishing someone would invent a way for you to take your favorite pair of glasses diving? Well, take heart! DiverVision has developed an ingenious, inexpensive system that allows you to adapt your everyday glasses for convenient, comfortable, temporary use in a dive mask.

With the DiverVision system (patent pending) you quickly and easily replace the ear pieces of your glasses with special supports. Then you just slip your glasses into your mask and go diving. That's all there is to it! Between dives you can quickly adapt the supports to accommodate your ear pieces so you can wear your glasses without your mask. While this arrangement may look a little strange, it will work—and makes a great item of discussion on a dive boat. After you're through diving for the day, simply replace the supports with your ear pieces. (You could even do this between dives since it takes only a moment.)

A DiverVision support basically consists of a U-shaped aluminum piece with five threaded holes; an adjustable plastic clamp with three threaded holes; three steel springs; and two plastic screws (one of which has a steel pin in it). All screws, holes and springs are the same diameter and thread size, and this is the key to the tremendous versatility of the system. The parts of the supports can be arranged in a multitude of configurations, which allows most glasses to be fitted to most dive masks in perfect position for the wearer. There are so many possible arrangements that I won't even go into them, except to say that plastic frames normally utilize a different arrangement than you see pictured here. But, if you're



The DiverVision system allows you to use your everyday glasses while diving.




photos/courtesy DiverVision

a person who likes puzzles, your DiverVision system can provide hours of entertainment while you see how many new combinations you can discover!

The parts of the supports are made of corrosion resistant materials and the longer springs are plastic coated at one end to prevent scratching the faceplate. Included in the DiverVision system is a mini screwdriver set and a 1.25 fluid ounce flask of Sea Drops anti-fog solution. That's all you need and the total package costs only \$39 plus \$3 shipping and handling!

Now, before you rush out and buy a DiverVision system for your current dive mask or rush out and buy a new, non-prescription mask, check a couple things out. First and foremost, your eyeglass frames must be narrow enough to fit into your intended mask without pressing on the skirt, which could cause the mask to leak. Second, some masks may be too low volume to accommodate your glasses. If your mask satisfies these two criteria, the DiverVision system, in one of its multitude of arrangements, should allow you to perfectly position your glasses. However, practice setting up the system at home before going diving. (I found a pair of glasses with screw head slots that were smaller than the smallest screwdriver blade in the kit. I had to slim the screwdriver blade slightly with a file so it would fit into the screw head.)

Sometimes, if someone puts enough thought into it, the most perplexing problems can be solved by the easiest and least expensive method. When it comes to good vision underwater, DiverVision has done the work—all you need do is enjoy! For more information contact DiverVision, 19011 East Mansfield Drive, Aurora, CO 80013; (303) 693-5091. 

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Photo by Steven M. Barsky

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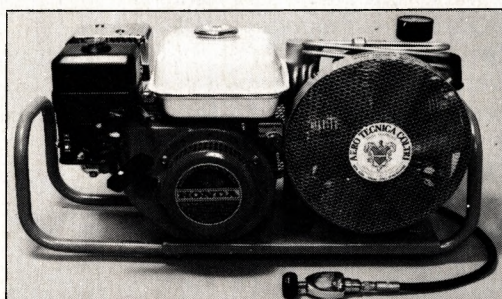
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NEW EQUIPMENT

SPEARS BY RIEDEL

Spears by Riedel, Inc. offers a new line of spearguns called the K series. These guns are equipped with 1/4 inch outside diameter shafts; open front; no slide; pointed shaft (no screw on head) with flapper/barb; and a mono-filament core, nylon wrapped, 300 pound test line. This new range of guns marks the first time a 1/4 inch outside diameter shaft has been commercially available in dive shops. The advantage of the smaller shaft is increased speed.



For information contact Spears by Riedel, Inc., P.O. Box 49363, Los Angeles, CA 90049; or (800) 289-2401.

ROPE SANDALS

Gurkee's Rope Sandals are great for the beach, boat, pool, house or the street—on the sand, over coral and in water. They dry in the sun and are machine washable. They will not shrink, mildew or fade. They are saltwater and chlorine resistant and float! Gurkee's rope sandals are available in men's and women's sizes for \$22.95.



For more information contact Gurkee's International, 4150 S. 87th E. Ave., Tulsa, OK 74145; (918) 664-7831. To place an order call (800) 759-8901.

VIKING SPORTSWEAR

If you've been looking for the perfect garments for your outdoor winter sports activities, visit your local Viking dealer and try on a set of Viking Sportswear. Viking Sportswear is the perfect alternative to owning multiple garments for skiing, diving or casual wear. These garments
(Continued on Page 35)



NIKONOS V

The Nikonos V features versatility never before available to the underwater photographer. It features aperture priority auto exposure, a hinged back for easy loading and a large viewfinder for clear framing, has a range of manual shutter speeds from 1/30 to 1/1000 of a second, and LED shutter speed and exposure indicators. The built-in TTL sensor measures light at the film plane, accurately controlling the output of a TTL dedicated flash. The camera also works with any Nikonos III/IV compatible strobe (without TTL strobe sensing). Tested to 160 ft.

10072 • Nikonos V, w/35mm f2.5 UWN w/spare o-ring, grease and battery	498.00**
10074 • Nikonos V, w/28mm f3.5 UWN w/spare o-ring, grease and battery	644.00**

HELIX SPECIAL NIKONOS PACKAGES

Package 1A: Nikonos V camera (w/battery & spare o-rings), 35mm f2.5 UWN, dive light & equipment case (18x13x8") w/foam	538.00**
Package 2A: Nikonos V camera (w/battery & spare o-rings), 35mm f2.5 UWN, Aqua F-3 TTL (w/arm, tray & sync cord), dive light & equipment case (18x13x8") w/foam	819.00**
Package 2C: Nikonos V camera (w/battery & spare o-rings), 35mm f2.5 UWN, Aqua F-3 TTL (w/arm, tray & sync cord), Marine Eye (28mm) adapter, Close Eye V w/framer (1.5), dive light & equipment case (18x13x8") w/foam	939.00**
Package 3A: Nikonos V camera (w/battery & spare o-rings), 35mm f2.5 UWN, Speedlight SB-103 (w/arm, tray, sync cord, diffuser, case & spare o-rings) & equipment case (18x13x8") w/foam	925.00**
Package 3C: Nikonos V camera (w/battery & spare o-rings), 35mm f2.5 UWN, Speedlight SB-103 (w/arm, tray, sync cord, diffuser, case & spare o-ring), Marine Eye (28mm) adapter, Close Eye V w/framer (1.5) & equipment case (18x13x8") w/foam	1045.00**
Package 4A: Nikonos V camera (w/battery & spare o-rings), 35mm f2.5 UWN, Aquafash 28 TTL (w/arm, tray, TTL sync cord, remote sensor w/slave, diffuser (15mm) & spare o-rings) dive light, light mount & equipment case (18x13x8") w/foam	989.00**
Package 4C: Nikonos V camera (w/battery & spare o-rings), 35mm f2.5 UWN, Aquafash 28 TTL (w/arm, tray, TTL sync cord, remote sensor w/slave, diffuser (15mm) & spare o-rings) Marine Eye (28mm) adapter, Close Eye V w/framer (1.5), dive light, light mount & equipment case (18x13x8") w/foam	1109.00**
Package 5A: Nikonos V camera (w/battery & spare o-rings), 35mm f2.5 UWN, Sea & Sea YS-50TTL (w/arm, tray & sync cord) & equipment case (18x13x8") w/foam	849.00**
Package 5C: Nikonos V camera (w/battery & spare o-rings), 35mm f2.5 UWN, Sea & Sea YS-50TTL (w/arm, tray & sync cord), Marine Eye (28mm) adapter, Close Eye V w/framer (1.5) & equipment case (18x13x8") w/foam	999.00**

NIKONOS LENSES

10315 • 15mm f2.8	1139.00
10314 • 20mm f2.8	499.00
10310 • 28mm f3.5 IC	259.00
10311 • 35mm f2.5 IC	119.00
10512 • 80mm f4 IC	259.00
10313 • 28mm f2.8 LC f/land use	175.00

NIKONOS VIEWFINDERS

10758 • DF-11 15mm V.F., UW use only	225.00
10759 • DF-12 20/28mm V.F., UW use only	135.00
10751 • 28mm sportsfinder	17.00
10753 • 35/80mm sportsfinder	19.00
10756 • DF-10 80mm viewfinder, topside use only t/Nikonos IV, V	73.50

NIKONOS CLOSE-UP OUTFIT

For parallax-free underwater close-up shots at 9-1/4" subject distance. Includes supplementary close-up lens, field frames for 3 lenses (works with 80mm, 35mm or 28mm) and mount braces. For Nikonos V and all earlier models.

10705N • Close-up outfit, basic without case	189.00
10705 • Close-up outfit, deluxe w/case	225.00

NIKONOS CASES

10420 • Carry case t/Nikonos IV and V	33.95
10414 • Eveready case for Nikonos III w/35mm, 28mm	25.00*
10415 • Eveready case for Nikonos II w/35mm, 28mm	19.50*
10418 • Lens case, CL-50, f/35mm	24.00
10419 • Lens case, CL-51, f/80mm	34.00
1000 G • Water Resistant Equipment Case (13x18x5.5") gray	59.00
1000 O • Water Resistant Equipment Case (13x18x5.5") orange	59.00

NIKONOS SPEEDLIGHT SB-102

When in use with the Nikonos V, the Speedlight's automatic TTL flash exposure control regulates flash output that's instantly reflected off the film. Use the SB-102's target light to accurately aim your strobe before you shoot. Covers a 28mm lens (79°). At full output it has a guide number of 104 on land with ISO 100 film (in feet). Five second recycling time with a fresh set of 6 C nicad or alkaline batteries. Includes case, diffuser, arm, tray, TTL sync cord & spare o-rings.

10102 • Speedlight SB-102	719.00
10101 • SB-102 head only w/TTL sync cord & diffuser	629.95

NIKONOS SPEEDLIGHT SB-103

For an underwater flash that's easy to use, the Nikonos SB-103 is all you need. Automatic TTL flash with the Nikonos V; manual flash control may be used with the Nikonos IV-A or III cameras in full, 1/4 and 1/16 power. It covers down to a 28mm lens. Offers optional multiple flash bracket and double sync cord. Uses 4 AA nicad or alkaline batteries. Includes case, diffuser, arm, tray, TTL cord & spare o-rings.

10103 • Speedlight SB-103	385.00
10104 • SB-103 head only w/TTL sync cord & diffuser	279.95

NIKON COMPACT BINOCULARS

7840 • Travelite 7x20 CF	69.95
7841 • Travelite 9x25 CF	79.95
7843 • Venturer II 10x25 CF	89.00

NIKON SEA & SPORT PLUS SERIES

Waterproof and fogproof, these rubber armored binoculars are at home on water. Flip-up/flip-down protective lens covers are permanently attached. Eyeglass wearers will appreciate the high-eyepoint eyepiece lenses and foldable eyecups. The rugged military design features sealed oculars, with individual internal focusing.



7794 • Yachtsman 7x50 IF (orange)	359.00
7785 • Seafarer 7x50 IF (black)	359.00

NIKON ACTION SERIES

7850 • Naturalist 7x35 CF	84.95
7851 • Ranger 10x50 CF	119.95

NIKON SPORTSMAN'S ATTACHE KIT

The perfect accessory for the outdoor enthusiast. This kit includes a hot/cold Aladdin thermos, big, soft stadium blanket for two made from a comfortable wool/acrylic blend, extra durable rain poncho, and a sporty lightweight barrel bag to carry everything.

Sportsman's attache kit	74.95*
Special! Purchase any Nikon binocular and get the Nikon Sportsman's Attache Kit for only	39.95*

*** Qualifies for Nikon U.S.A. extension tube offer.
Products include Nikon Inc. U.S.A. limited warranty application.

HELIX/SONY DEMO VIDEO-8 OUTFIT

These are demonstrator models refurbished by Sony and include the CCD-M8 Sony 8mm Handycam cam-corder with 2/3" CCD imaging sensor and flying erase head, the EV-C8 portable recorder/player with flying erase head, control L output, record up to 2 hours on P6-120 video cassette. Also included are a carry case, an AC power supply, nicad battery, and an RF adapter. These outfits include new equipment warranties from Sony of America, 90 days labor and 1 year

parts. These are demonstrator models refurbished by Sony.

This exceptional Sony-8 outfit is only sold complete with new housing, as listed below. All prices include complete Sony Video-8 outfit.

SONY VIDEO-8 OUTFIT

New! EWA underwater flexible housing, w/ flat port, rated to 30'	925.00*
New! Ikelite #6030.3 housing w/dome port & W.A. lens adapter, rated to 150'. Includes start/stop & distance/white balance controls plus double-contour leadhandgrips	1249.00*
New! Aquavision Capsule 10 housing rated to 250'. Features single control (on/off), wide lens adapter (94°), hydro microphone, and righthand contoured grip	1559.00*
New! Pro-Line aluminum housing w/dome port, wide angle adapter, rated to 325'	1609.00



SONY/IKELITE PACKAGE

Sony CCD-V9 Handycam (w/12-72mm f1.6 macro zoom), 2/3" CCD (380,000 pixels), high resolution chip, control L output, charger, nicad battery, UR-Pro Marine filter, Ikelite housing and fisheye lens adapter

1849.00

SONY PACKAGE

Sony CCD-V9 Handycam, UR-Pro Marine filter and MPK-F40 housing

2199.00

ADD-ON EDITING PACKAGES

Add to your Sony CCD-V9 or EV-C8 deck supplied with your Pack-8 Outfit Professional looking edits (noise free transitions) and ease of auto editing (memory of RM-E100VA that holds up to 8 scenes).

8 to 8 Add-On Editing Package: Sony RM-E100VA remote editor, EV-C8 recorder/player deck (reconditioned EV-C8 w/new Sony warranty), ACP-80 AC adapter and dubbing cable	739.00*
8 to VHS Add-On Editing Package: Sony RME-100 remote editor, SLV-50 VHS recorder/player deck and dubbing cable	729.00

* Limited quantities

All prices shown are Helix cash prices for mail order only and are subject to change without notice. Prices do not include shipping.

HELIX®

**THE SOURCE
FOR ALL YOUR
PHOTO/DIVER NEEDS**



STEINER MILITARY MARINE BINOCULARS

Steiner binoculars were originally designed, developed and produced for military, police and security forces around the world. They require no focusing once they have been adjusted to your eyes! You can follow focus instantly and naturally. Military/Marine series binoculars are known for their light weight, extreme ruggedness and water resistance. All lenses are precision aligned, shock-proof and anti-glare coated.

375 • 7x50 Commander w/illuminated compass	559.00
275 • 7x50 Military/Marine	359.00
260 • 6x30 Military/Marine	159.00

HELIX EXTENSION TUBE SYSTEM

Our unique extension tube system is designed to help you build the most versatile set of tubes and framers available, for land use as well as underwater. With just 3 basic tubes, you can develop up to 10 different tube, framer and lens combinations for your 35mm or 28mm Nikons UWN lenses without having to buy 10 different tubes and framers.

Constructed of sturdy black anodized aluminum, each extension tube easily attaches between your Nikons camera and lens. The epoxy-coated stainless steel framer connects to the extension tube with a thick knurled knob. Each tube's inside barrel has been specially turned to reduce internal reflections and improve image contrast.

HUP-122 • Basic extension tube set w/2 tubes and 3 framers f/35mm UWN (1.1, 1.2, 2.1)	86.00
HUP-230 • Basic set w/2 tubes and 3 framers f/28mm UWN (1.1, 1.1.8, 1.2.75)	86.00
HUP-123 • Deluxe set w/3 tubes and 4 framers f/35mm UWN (2.1, 1.1, 1.2, 1.3)	120.00
HUP-124 • Master set w/3 tubes and 6 framers (1.1.8, 1.2.75 f/28mm UWN; 2.1; 1.1, 1.2, 1.3 f/35mm UWN)	154.00
HUP-125 • Super Master set w/3 tubes and 7 framers (2.1, 1.1, 1.2, 1.3 f/35mm UWN; 1.1, 1.1.8, 1.2.75 f/28mm UWN)	171.00
HUP-HLX • Helix extension tube upgrade kit f/Helix or Subsea Basic set to Super Master set w/1 tube & 4 framers, instructions & color code labels	86.00
HUP-311 • 1.1 tube w/framer f/35mm UWN	39.50
HUP-312 • 1.2 tube w/framer f/35mm UWN	39.50
HUP-313 • 1.3 tube w/framer f/35mm UWN	39.50
HUP-212 • 1.1.8 tube w/framer f/28mm UWN	39.50
HUP-213 • 1.2.75 tube w/framer f/28mm UWN	39.50
Replacement framer (specify ratio & lens)	25.00
HUP-211 • Framer only 1:1 f/28mm UWN	25.00

HELIX LAND USE FRAMERS

It is now possible to get macro shots with your Nikons camera and 35mm UWN above water. Framers calibrated for surface use with Helix extension tubes are simple and easy to use.

HUP-SFS • Set of 3 framers f/surface use only, (1.1, 1.2, and 1.3) f/35mm UWN and Helix extension tubes	59.00
HUP-SF1 • Surface use framer (1.1) f/35mm UWN and Helix blue tube	25.00
HUP-SF2 • Surface use framer (1.2) f/35mm UWN and Helix green tube	25.00
HUP-SF3 • Surface use framer (1.3) f/35mm UWN and Helix red tube	25.00

HELIX AQUAFASH 28TTL

The Helix Aquafash 28TTL functions in both automatic and manual exposure modes down to 165 feet, and offers a high UW guide number of 32 at ISO 100. The twin reflector/tube design insures a coverage area sufficient for a 28mm lens. Add the wide angle diffuser to handle a 15mm lens. Auto exposure control with the Nikons III or IV and TTL auto exposure control with the Nikons V. It operates on 6 AA alkaline or nicad batteries (not included) and comes complete with arm, dedicated TTL sync cable, bracket, mounting tray and wide angle diffuser.

HAF-TTL • Aquafash 28TTL	449.00
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HELIX AQUAFASH 28

This handle mount flash offers all of the features of the 28TTL, except it is supplied with a standard automatic exposure/sensor module (non-TTL) for use with Nikons III, IV, or V. Comes complete with arm, connector cables, bracket, and mounting tray. Includes 2 year limited warranty. Wide angle diffuser optional.

HAF-1/2 • Aquafash 28 f/Nikons I/II	359.00
HAF-3/4 • Aquafash 28 f/Nikons III/IV/V (non-TTL)	359.00
HAF-EO • Aquafash 28, specify EO	369.00

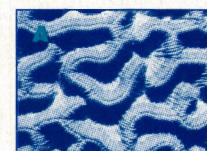
HELIX EO CONNECTORS

HUP-E0II • 6" EO to Nikons I/II	63.50
HUP-E0III • 6" EO to Nikons III/IV/V	63.50
HUP-EXT • 10 ft. male/female EO	107.00
HUP-EXT • 20 ft. male/female EO	116.00
HUP-FF2 • EO #59 female bulkhead 90° w/PC, 11", f/housings up to 1/2" thick	76.50
HUP-FF3 • EO #59 female bulkhead 90° w/PC, 11", f/housings up to 3/4" thick	76.50
HUP-MD0 • EO male connector cover	11.95
HUP-FD0 • EO female connector cover	11.95
HUP-MMF • EO "Y" connector (male, male, female)	195.00
HUP-MFF • EO "Y" connector (male, female, female)	195.00

HELIX UNIVERSAL SLAVE STROBE

Our easy-to-use slave strobe requires no cables or connectors, and is designed to be compatible with the Helix Auto Marine housing, Hanimex or Sea & Sea 110 and 35mm cameras, and Ikelle disc or 110 housings. A deflector directs the camera strobe to the slave sensor. It is supplied with a 9" arm which helps reduce backscatter problems that are common in low-visibility waters. Black.

HUP-USS • Universal slave strobe, specify camera or housing	98.00
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ONE CAMERA,



ONE DIVE,



AND 3 MACRO RANGES

These photographs illustrate the versatility of the Helix macro system. With the Helix green extension tube with removable framer on your Nikons 35mm UWN, you get a 1:2 image ratio for stunning close-ups (A). This used to be your only choice without going to the surface or carrying a second camera. But now you can attach the HUP-CWG close-up wide angle adapter with framer in front of your lens while you are underwater and shoot at 1:4 (B). By switching to the HUP-WAG wide angle adapter, you are in focus from 11" to infinity and get a view like a 28mm lens (C). All without surfacing!

With the Helix red extension tube and removable framer on your Nikons with 35mm UWN you're shooting at a subject to image ratio of 1:3. When you attach the HUP-CUL close-up lens adapter and framer to the front of your 35mm UWN you can shoot at 1:2. By switching to the HUP-CWA close focus wide adapter you get a shooting range of 9" to 3-1/2'.

New! Helix Add-On Underwater Adapters f/green tube (1 f-stop)	
HUP-CWG • Close-up wide angle adapter w/framer (1.4)	82.50
HUP-WAG • Wide angle adapter 28mm (focus 11" to infinity)	135.00

Helix Add-On Underwater Adapters f/red tube (2/3 f-stop)	
HUP-CUL • Close-up lens adapter w/framer (1:2)	65.95
HUP-CWA • Close focus wide angle adapter (9" to 3-1/2')	65.95

TOSHIBA UNDERWATER FLASHLIGHTS

Made of shock resistant ABS resin, Toshiba underwater flashlights are waterproof to 165 feet. Both include a sliding switch located on the lamp head, a ridged battery casing for a secure grip and a wrist lanyard. The K-132 has a krypton bulb within a yellow battery case. The K-133 has a brighter tungsten halogen bulb with a navy blue case. Both flashlights utilize 4 D cells (not included).

53415 • K-132 Flashlight w/krypton lamp	33.50
53410 • K-133 Flashlight w/spare halogen lamp	37.00
53416 • Krypton lamp for K-132 (repl.)	3.00
53412 • Halogen lamp for K133 (repl.)	8.00

* While supplies last

HELIX/OCEANIC

Oceanic strobes offer state-of-the-art digital logic circuitry for uncompromising accuracy, a completely sealed case with magnetic switches, wide 110° beam angle, full power recycle in 3.5 seconds, and above water guide number of 85 at ISO 64. All strobes are rated to 400'. For TTL operation only with the Nikons V, order the Photopak I, for use in TTL, as a slave strobe or manual operation (with optional sync cord), the Photopak II is the answer. For a manual unit with built-in slave sensor, order the Photopak III. Coupled with an exclusive offer from Helix of a free Hi-lite dive light, holder and "Splash" shorty wet suit (retail value \$191.50), one of these packages is the perfect answer to your underwater illumination needs.

Helix/Oceanic Underwater TTL Photopak I: Oceanic OS-3000TTL strobe, charger, and TTL sync cord, ARM-021 arm (21"), NPG-105S camera tray (w/shoe), HUP-902 Helix equipment case (w/foam), **FREE** U-K Oceanic light holder, **FREE** Oceanic Hi-lite dive light, **FREE** Oceanic "Splash" shorty wet suit (2.5mm) w/long sleeves

Helix Special! 830.50*

Helix/Oceanic Underwater TTL Photopak II: Oceanic OS-3000 Master strobe (w/slave, two power levels, and charger), TTL sync cord, ARM-021 arm (21"), NPG-105S camera tray (w/shoe), HUP-902 Helix equipment case (w/foam), **FREE** U-K Oceanic light holder, **FREE** Oceanic Hi-lite dive light, **FREE** Oceanic "Splash" shorty wet suit (2.5mm) w/long sleeves

Helix Special! 900.00*

EWA RAIN COVERS

E370 • C-35 cape rain hood f/SLR	10.95
E373 • C-9 hurricane hood f/SLR	45.95
E340 • Watersound-VHS f/walkie talkies (15" max.)	37.50
E344 • Watersound-VHF f/walkie talkies (18" max.)	45.00

EWA "MASTER SERIES" UNDERWATER HOUSINGS

Practical operating depths 30 to 60ft; tested to 100 ft. depth.

E001 • U-F f/35mm compact SLR w/winder	72.00
E002 • U-FXP f/35mm SLR w/winder, strobe, or zoom lens	79.00
E003 • U-FX SLR w/small zoom & top mount flash	89.00
E004 • U-FPN f/large SLR and large motor drives and lenses up to 90mm	89.00
E007 • U-AFM f/compact autofocus camera	38.00

EWA UNDERWATER HOUSINGS FOR VIDEO CAMERAS

Practical operating depth to 30ft.

E151 • U-VJ f/JVC (GRC-1)	119.00
E153 • U-VCAF f/Olympus VX402, Pan. PV200	119.00
E154 • U-VM Sony CCD-M8 Handycam	119.00
E157 • U-VCN f/Canon VME1	119.00
E159 • U-VJAF f/JVC CR-C2 (VHS-C)	119.00
E160 • U-CMF w/new port f/Olympus VX403/404	168.00
E161 • U-VMBF f/Nikon Action 8, Olympus 801	168.00
E162 • U-VMK f/Minolta CR8000S AF	159.00
E163 • U-VSC f/Sony CCD-V3, Ricoh R-250	168.00
E165 • U-VSP f/Sony CCD-Pro 110	168.00
E167 • U-VSM f/Sony CCD-V5, Ricoh R600	168.00

MORRIS AQUA F-5TTL

The Aqua F-5TTL is specially designed for underwater usage. It does not require a housing and offers a multitude of state-of-the-art features.

Twin reflectors provide wide angle coverage, allowing use of the flash with 28mm lenses (or 15mm with optional diffuser). This also provides softer lighting for macro photography and allows longer flash tube life. It has a guide number of 32 at ISO 100 (in feet) underwater.

The F-5TTL can operate in TTL with the Nikonos V, with full auto exposure control with Nikonos III/IV cameras, and in manual control with full and 1/4 power settings.

The TTL auto sensor module with built-in slave mounts on the Nikonos accessory shoe for hand-held operation. It may also be removed for more compact operation when the flash is being used in manual.

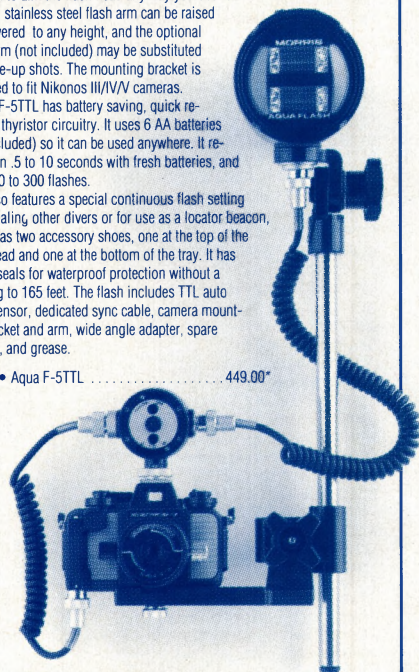
The rugged interchangeable coiled flash cord extends well beyond arm's length. Easy to operate tilt and swivel controls allow complete freedom to aim the flash head any way you desire.

The 17" stainless steel flash arm can be raised and lowered to any height, and the optional short arm (not included) may be substituted for close-up shots. The mounting bracket is designed to fit Nikonos III/IV/V cameras.

The F-5TTL has battery saving, quick-recycling thyristor circuitry. It uses 6 AA batteries (not included) so it can be used anywhere. It recycles in .5 to 10 seconds with fresh batteries, and gives 80 to 300 flashes.

It also features a special continuous flash setting for signaling, other divers or for use as a locator beacon, and it has two accessory shoes, one at the top of the flash head and one at the bottom of the tray. It has O-ring seals for waterproof protection without a housing to 165 feet. The flash includes TTL auto slave sensor, dedicated sync cable, camera mounting bracket and arm, wide angle adapter, spare O-rings, and grease.

12040 • Aqua F-5TTL 449.00*



MORRIS AQUA F-5

This flash has the same features as the F-5TTL except that it comes with auto exposure slave sensor and does not work TTL with the Nikonos V.

12030 • Aqua F-5 359.00*

MORRIS AQUA F-3TTL

This submersible flash automatically controls light output according to f-stop and shutter speed, and provides TTL control with the Nikonos V. High/low selector gives you dual manual exposure output. Battery chamber cover and light emitting area are O-ring sealed for protection down to 180 feet. The TTL flash head swivels and tilts for a wide variety of lighting possibilities. Five to 10-second recycling time with fresh set of 4 AA alkaline batteries (not included). Underwater guide number 22 at ISO 100 in full power. Includes 15mm wide-angle adapter.

12020 • Aqua F-3TTL 279.95*

MORRIS AQUA F-3

This strobe features a remote sensor, 2 f-stop auto range, mounting brackets and connector for Nikonos III, IV or V. It uses 4 AA alkaline batteries (not included) which provide 130 full-power flashes, and recycles in less than 7 seconds. The F-3 has a guide number of 22 at ISO 100 (underwater) and a 70° beam angle. Strobe can be set for manual operation, 1 of 2 auto f-stops, or test, to check strobe function without wasting film.

12010 • Aqua F-3 199.00*

VIVITAR 3000 AF SLIDE PROJECTOR KIT

This 35mm slide projector has a remote control and autofocus, and slide preview. It comes with and 85mm f2.8 lens, and two 100 slide capacity trays and carrying case.

3000 AF Projector Kit (reg. \$171.00) **Special! \$149.00**

* Current inventory only

** Special order—allow 4 to 6 weeks

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MASTERCARD &
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HELINON BINOCULARS

Excellent Japanese optics at exceptional prices. Tripod use recommended for 20x80 and 30x80.

HLX037 • 8x30 DWCF roof prism	89.00*
HLX038 • 8x40 DWCF roof prism, rubber coated	99.00*
HLX041 • 30x80 BCF	215.00*
HLX036 • Binocular tripod adapter	13.50*

AQUA VISION SYSTEMS

0AIN • Aquatica 3-N Hsg. [req. optional port(s), gears, connector(s) & bracket(s)]	959.00**
0030 • Dome port	264.00
0031 • Macro port	237.00
Focus gear (please specify lens)	49.50
A2500 • Aperture gear	49.00
0090 • Nikonos III/IV connector	40.00
0110 • EO connector	74.00
C80011 • Capsule "10" I/Sony Handycam	699.00
C80050 • Grip-left hand	58.00
C80053 • Oceanic shoe	13.50
C80054 • Adapter shoe I/Sea & Sea (Sony) light	27.00

AQUACRAFT

S-31 • Extension tube framer (1:1) I/35mm lens	54.95*
S-32 • Extension tube framer (1:2) I/35mm lens	54.95*
S-33 • Extension tube framer (1:3) I/35mm lens	54.95*
S-34 • Extension tube framer (1:2.75) I/28mm lens	54.95*
S-82 • Extension tube framer (1:1.5, 1:2, 1:3) I/35mm lens	128.00*
S-56 • Lanyard w/brass clip	5.95
A-412 • "Goody" box, 3x5.5x8.5"	8.95
A-307 • Camera lanyard	4.50
A-365 • Large mesh tote bag	24.00
S-63 • Focusing wand (recommended for S-2, S-3)	15.95*
B-117 • Knee protector	37.25

BEALL

43HCJ1 • Thumb release I/Nikonos II	9.95
43HCJ3 • Thumb release I/Nikonos III	9.95
34HCJ1 • Lens protector	3.00
45HC2 • Octopus protector	2.50
39HCJ2 • Flash connector cover	2.80
33HC2(B) • Wrist lanyard w/bronze snap	5.30
27HC10 • Tripod nut	4.40

DACOR

SPB • Underwater slate board	6.95
BP • Belt pocket	6.00
PA-105 • Compact stainless steel 7-1/2" tray w/wood handle I/Nikonos II/III & strobe	14.95*
PA-101 • Stainless steel 9-1/2" tray w/4-3/8" tapered handle I/Nikonos II/III & 2x strobes	17.95*
PA-104 • As above, but w/rosewood handle	18.95*
PA-554 • Resin-impregnated rosewood handle	5.00*
PA-106 • Thumb shutter release I/Nikonos III	7.50*

FUJI

8mm movie camera w/housing	99.00*
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GREEN THINGS

ME • Marine Eye (28mm) adapter I/35 UWN	79.95
WE • Wide Eye (21mm) adapter I/35 UWN	219.95
FE • Fish Eye adapter I/35 UWN (150° cropped top & bottom) and 28 UWN (160° circular image)	219.95
CEV35 • Close Eye V w/framer I/35 UWN	79.95
CEV28 • Close Eye V w/framer I/28 UWN	79.95
CEII • Close Eye II add-on lens (12-19.5") I/35 UWN	49.50
CEIII • Close Eye III add-on lens (7.75-10") I/35 UWN	49.50
S-63 • Close-up wand (recommended I/CE II & CE III)	15.95*
C&W • Close & Wide set w/extension tube (1.3), close-up lens w/framer (1.2) & close focus 28mm adapter (max. 3-1/2 ft.)	185.00
246 • System 246 I/35 UWN w/ext. tube & framer (1.2), add on lens w/framer (1.4), and wide angle adapter (28mm)	249.00

HELIX DIVE LIGHTS

HUP-200 • Photo dive light	14.95
HUP-201 • Photo dive light w/krypton lamp	19.95
HUP-205 • Mini photo dive light	9.75
HUP-POA • High Intensity conversion kit I/HUP-200	5.95

HELIX MISCELLANEOUS

HUP-DBT • Double bracket (tray only) I/Nikonos V and 2X SB102/103	85.00
HUT • Underwater T-shirt (specify size)	7.95
HFK • Flipper key ring	1.95
HUP-WDK • Audible water detector kit	42.95
HUP-WDL • Audible water detector w/LED	54.95
HUP-OK2 • O-ring set I/Nikonos I/II (HOK-II)	5.95
HUP-OK3 • O-ring set I/Nikonos III (HOK-III)	5.95
HUP-OK5 • O-ring set I/Nikonos V (HOK-V)	5.95
HUP-OET • O-ring extractor tool kit	11.95

HELIX/KAMBA

Helix Kamba housing I/A series Canon w/winder	299.50*
Helix/Kamba package includes Canon AV-1, Canon 28mm f2.8, and winder A-2	595.00
Internal viewfinder I/Canon	53.50

HELIX CASES

Accessory tote (9x4x5")	8.95
Equipment case w/die cut foam I/Hanimex 35mm & slave strobe (14-1/2x9x4-1/2")	23.95
Equipment case w/foam (18x13x8")	44.95

HELIX LIGHTING

HL-4000 • U/W Halogen movie/video light, 4.4 AH/12V, w/charger (req. optional lamp) (50W/96 min., 100W/48 min., 175W/27 min.)	695.00*
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HYDRO PHOTO

HPC127 • Cobra flash arm, 27"	75.00
HPC119 • Cobra flash arm, 19"	75.00
Base plate w/handle (specify I/Nikonos I/II or Nikonos III)	24.95
Base plate (Nikonos IV/V)	24.95
Base plate (Nikonos IV/V) I/2x arms	24.95
T-1 close-up lens I/35 UWN	43.95
T-2 close-up lens I/35UWN	43.95
T-3 close-up lens I/35UWN	43.95
1228 • Close-up lens I/28 UWN	43.95
FW • Focusing wand	18.00
F35 • Framer 35	18.00
F28 • Framer 28	18.00

IKELITE HOUSINGS

Disc housing w/water correction lens I/Kodak 3100	59.95
Close-up lens w/framer set I/disc case	35.95
Sportsfinder II I/110 or disc housing	7.95
SLR-AF Super Eye housing (specify camera)	CALL
SLR-Super Eye housing (specify camera)	CALL
SLR-MD Super Eye housing (specify camera)	CALL
Dome port w/shade	CALL
Extension port (4-1/2")	CALL
E/O connector (female)	99.95

IKELITE HOUSINGS FOR VIDEO

6030.3 • Housing I/Sony CCD-M8U as above plus wide angle lens adapter and dome	449.95
6033.5 • Housing I/Sony CCD V5	540.00
6033.9 • Housing I/Sony CCD-V9	CALL
6034.3 • Housing w/wide angle adapter I/Sony F-40	CALL
6034.11 • Housing I/Sony CCD-V11	CALL

All prices shown are for mail order only and are subject to change without notice. Prices do not include shipping.

IKELITE LIGHTS

Mini C-lite K	19.95
Mini C-lite H	23.50
Mini C-mark strobe beacon	55.00
Mini C-holster	10.95
Modular Super-lite (req. optional charger)	209.00
Modular Video/Movie lite (req. optional charger)	209.00

IKELITE STROBES

4040.5 • Substrobe MS slave strobe	114.00
4042 • Substrobe MV TTL strobe	135.00
4048 • Substrobe 100 TTL strobe	299.00
4049 • Substrobe 150D strobe	349.00
4050 • Substrobe 150 strobe	429.00
4056 • Substrobe 225 strobe	479.00

IKELITE SUBSTROBE PACKAGES

3942.42 • MV Package: includes Substrobe MV, TTL sync cord, tray/handle, film advance lever, handle and mount I, and Mini C-lite H	289.00
3945.52 • 150 TTL Package: includes Substrobe 150, quick charger, quick handle arm, case w/die-cut foam, TTL sync cord, tray/handle, and film advance lever	675.00

IKELITE SUBSTROBE ACCESSORIES

4103 • Sync cord (TTL)	56.00
4103.2 • Sync cord f/dual TTL strobes	100.00
4104.55 • Sync cord f/dual Nikonos cameras	100.00
4104.8 • Sync cord (Nelson)	64.00
4104.9 • Sync cord (EO)	100.00
1082 • 12V modular charger	13.50
1083 • 120/240V modular charger	26.95
4052 • 120V modular quick charger	32.00
4075 • Strobe arm I, single section	23.95
4081 • Strobe quick release handle, 22"	59.95

PELICAN

1400 • Pelicase, 12-1/4x9-1/4x5-1/2"	45.00
1500 • Pelican case, 17-1/2x11-7/8x6-1/2"	65.00
1600 • King Pelican case, 22x17x8"	105.00
500 • Guard box w/foam (black) 8-1/2x6-1/2x3-1/2"	13.95

SEA & SEA 110 POCKETMARINE CAMERA & ACCESSORIES

0200 • PC-1 Pocketmarine 110	144.95
0210 • PC-1 Pocketmarine 110 w/Sealoc bulkhead	165.00
Helix/Sea & Sea Package: includes 110 camera & Helix slave strobe	239.95
0201 • CU-1 Macro lens (5") w/wand	58.50
0202 • CU-2 Close-up lens	37.00
0260 • Shoulder bag	22.50

SEA & SEA 35mm MOTORMARINE CAMERAS & ACCESSORIES

0100 • PC-35/M Motormarine 35mm w/meter	CALL
0110 • PC-35/M Motormarine 35mm w/meter & Sealoc bulkhead	CALL
Pkg. SS1 • Sea & Sea/Helix Package: includes PC-35/M & HUP-901 case w/ die cut foam	CALL
Pkg. SS2 • Sea & Sea/Helix Package: includes PC-35/M & Helix slave strobe	CALL
Pkg. SS3 • Sea & Sea/Helix Package: includes PC-35/M & Helix slave strobe & HUP-901 case	CALL
0103 • WL-24 Wide lens adapter (24mm)	CALL
0104 • SWL-16 wide lens adapter (16mm)	CALL
0101 • CU-3 Close lens	CALL
0102 • CU-5 Macro lens w/wand	CALL

SEA & SEA STROBES

1850 • YS-50 TTL w/arm and tray	CALL
1550 • YS-100 TTL strobe w/arm, tray, and diffuser	CALL
2500 • SA-II Sea arm (2 section), medium 17"	CALL
2700 • SA-II Sea arm (2 section), long 28"	CALL
2800 • SA-III Sea arm (flex)	CALL

SEA & SEA LENSES FOR NIKONOS

6300 • 15mm f3.5 wide lens w/case	CALL
0150 • Optical viewfinder f/15mm	CALL
6100 • 17mm f3.5 wide lens w/case	CALL
6000 • 20mm f3.5 lens w/case	CALL
6200 • Nikonos SWL-16 lens kit	CALL
0140 • Optical viewfinder f/18, 28, 35mm	CALL

SEKONIC

L-164B • Marine Meter II	169.00
L-158WH • Housing and meter	55.00
L-188WH • Housing and meter (battery powered)	75.00

SONY

MPK-F40 • New! Sony Marine Pack Housing, rated to 130', for CCD-V9, CCD-F40 and CCD-SP7 with wide angle adapter, underwater microphone, one-trigger operation (simple), sport finder and LED water alarm	999.00
MPK-V11 • New! Sony Marine Pack Housing, rated to 250', for CCD-V11 with wide angle lens adapter, underwater microphone, controls for start/pause, zoom, auto/manual focus and power focus and 3" LCD color monitor	1495.00

SUBATEC

Subawinder III add-on wide angle lens	269.95
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UNDERWATER KINETICS LIGHTS & ACCESSORIES

A1101-2 • Super Q light w/charger	62.50
A3401-2 • Super QXL3R w/charger	59.00
A3501-2 • Super QXL3	21.00
A3601-4 • Super QXL4R w/charger	70.00
A3700-2 • Super QXL4	24.00
H1002-4 • Nylon belt pouch f/QXL3	12.00
H1011-4 • Nylon belt pouch f/QXL4	13.95
H1003-4 • Universal holder w/rubber strap	15.00
H1004-4 • Universal holder w/Velcro	17.00
H1005-4 • Belt holder	10.00
H1012-0 • Head mount light holder	16.00

UNDERWATER KINETICS DIVERS DRY BOXES

C1103-2 • Dry box, large (9x7.1x6.3")	19.95
C1101-2 • Dry box, small (9x7.1x4.5")	16.95
C1201-2 • Dry box, mini	12.95

UNDERWATER KINETICS DRY CASES

C1502 • 518 Dry Case (18x13x5.5")	65.00
C1503 • 718 Dry case (18x13x7.2")	79.00

UNDERWATER KINETICS HOUSINGS FOR VIDEO

P5002-0 • Pro-Line housing f/Sony CCD-M8U w/dome port, wide angle lens adapter. Rated to 325'	749.00*
P5102-0 • Package with Pro-Line housing f/CCD-M8U, 2) Aqua-Sun 800 lights, 2) Aqua-Sun video arms and 821 dry case	1239.00

UNDERWATER KINETICS TUS

Pro-Line housing f/Nikon F-3 w/motor drive and action finder, includes aperture and focus gear, water detector, lighting system, and eye cap (req. optional port, strobe sync plug, and arm mount block)	1260.00
EO strobe connector	82.50
Sealoc strobe connector	40.50
Macro port f/55mm	135.00
Macro port f/105mm	195.00
Dome port f/24mm	313.50
Dome port f/15mm	420.00
Dome port f/180° fisheye	525.00
Strobe arm mounting block-universal (Tussy, Oceanic)	13.25
Vinyl port protector f/macro port	8.95
Vinyl port protector f/24mm dome port	9.95
Vinyl port protector f/15mm dome port	12.95

UW RESEARCH PRODUCTS

UR Pro Marine filter (specify 46, 49, 58mm)	45.00
UR Pro Marine filter, 67mm f/20mm UWN	79.95
UR- Pro Marine filter f/Sony Handycam CCD M8	59.95*
Cyclops Marine filter f/15mm UWN complete w/lens shade	169.50**

UNDERWATER MAGAZINE

We are proud to announce that Helix is now the United States distributor for Neville Coleman's **UNDERWATER** magazine. This quarterly magazine is geared towards serious divers the world over. **UNDERWATER** regularly features articles on archaeology, natural history, photography, exploration and travel, in all parts of the globe. Diving techniques, medicine, survival and equipment tests round out each issue.

We are offering subscriptions to **UNDERWATER** at a low introductory price of \$14 per year (4 issues). Or you can extend your savings and receive two years (8 issues) for only \$25! International orders add \$6 per year for surface shipping or \$22 per year for air.

To order, call us and charge it on your Visa, MasterCard or Discover Card.

USED EQUIPMENT

Send \$3.00 for our latest Underwater Used Equipment List and receive a coupon for \$5.00 towards the purchase of any used equipment in stock. Used equipment subject to prior sale and your approval. Helix 6 month limited warranty included with used equipment.

G194RU • Canon AF35M2, Hirox housing (100'), slave strobe & bag	259.00
G227RU • Ewa marine housing U-FZ f/SLR w/zoom or f/05mm	70.00
G027RU • Hanimex Amphibian 110 camera	89.50
G126RU • Helix Aquafash 28TTL complete	379.00
G145RU • Helix double Nikonos camera tray	49.95
G217RU • Helix HUP-230 extension tube set (1.1, 1.1.8, 1.2.75)	65.00
F1101RU • Helix HL-7000 video light w/charger	699.00
F833RU • Helix/Kamba housing f/Nikon EM	225.00
F841RU • Helix/Kamba housing w/Canon AV-1, 50mm & winder	459.00
F879RU • Ikelite Substrobe S f/35, 110	85.00
G199RU • Nikon L35AF2, HUP-010 housing (100'), slave strobe & bag	275.00
G235RU • Nikonos 28mm f/3.5 UWN	229.00
G158RU • Nikonos 35mm f/2.5 UWN N/N	99.50
G215RU • Nikonos 35mm UWN f/2.5 chrome	84.50
G212RU • Nikonos II body	199.00
G214RU • Nikonos III body	335.00
F1021RU • Nikonos IV body	225.00
G133RU • Oceanic Net-300 extension tube set	89.50
G210RU • Oceanic OM-100 underwater light meter	89.00
F925RU • Oceanic OS-2003 strobe w/EO and charger	349.00
G147RU • Sea & Sea macro lens w/wand f/110	45.00
F852RU • Sea & Sea YS-20 strobe w/sealoc	69.50
G125RU • Sekonic L-164 Marine Meter II w/case	149.00
F411RU • Subsea MK-20 strobe w/EO	99.00
G230RU • Subsea MK 150 w/EO, tray, 17" universal arm	545.00
F824RU • Sunpak Marine 32 strobe w/dif. & Oceanic tray f/Nikonos III	160.00

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** special order — allow 4 to 8 weeks

All prices shown are Helix cash prices for mail order only and are subject to change without notice.

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NEW EQUIPMENT

(Continued from Page 34)

can be used for many activities and will keep you warm and dry in most weather.

Viking Sportswear is made from a combination of fabrics including a tear resistant nylon taffeta, several layers of aluminized polyethylene film and an inner layer of Arctic Fleece. This combination of materials gives warmth without bulk.

Viking Sportswear offers exceptional wicking ability, transporting moisture away from your skin. In addition, in the rare situation where your garment becomes completely soaked, Viking Sportswear dries rapidly.

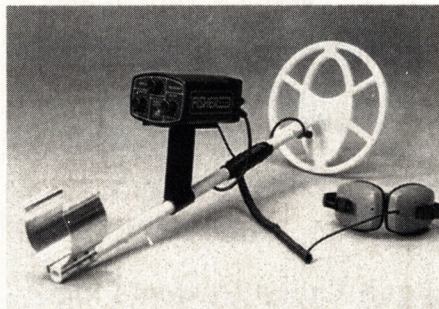


The experienced drysuit diver will appreciate Viking Sportswear's low weight requirements. Most divers find they can remove six pounds or more from their weightbelts when using it.

Viking Sportswear is distributed exclusively by Viking drysuit dealers. For more information contact Viking America, Inc., 30700 Solon Industrial Parkway, Solon, OH 44139, (216) 349-1319.

SPIDER SEARCHCOIL METAL DETECTOR

Fisher Research Laboratory has developed a 10.5 inch diameter "spider" searchcoil for its 1280-X Aquanaut underwater metal detector. An eight inch coil will still be the coil of choice for very



small targets or trashy search areas. However, the new 10.5 inch coil will cover more ground with each sweep and penetrate deeper, depending on target size and ground mineralization.

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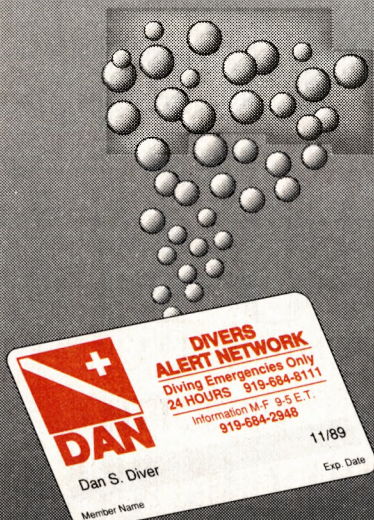
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NEW EQUIPMENT

either the standard coil (\$649.95) or new 10.5 inch spider coil (\$659.95). To keep the 1280-X watertight to 250 feet, the coils are not interchangeable by the operator. However, current owners may have their 1280-X converted to the spider coil by the factory for \$150.

For more information contact Fisher Research Laboratory, Dept SD, 1005 I Street, Los Banos, CA 93635-4398; (209) 826-3292.

SINGLE BLADDER BC

The new Economy Single Bladder Buoyancy Control System from Parkway is designed for comfort, durability and style, with many performance features found in Parkway's top-of-the-line systems and a few less frills.

This BC vest has an all-in-one bladder, rather than a separate bladder inside its shell. This results in a slimmer contour. It's made of heavy duty nylon, reinforced with a polyurethane layer inside. Seams



are fused for an airtight bond. Shoulder flaps do not inflate. Full cut arm openings add ease of movement.

The Economy Single Bladder BC features: molded Softbarn backpack, Softouch power inflator, D-rings, overpressure valve, quick dump, deep pocket and snap and pull harness straps.

Parkway's Economy BC is available in models with 25, 33, 42 and 46 pounds of lift. It's available in black/silver/gold/teal and black/royal/silver color combinations. The suggested retail price is \$270.

For information on Parkway's full line of color coordinated BC systems, wetsuits, tanks and other diving equipment and accessories contact Parkway/Imperial, 241 Raritan Street, South Amboy, NJ 08879; (201) 721-5300.

How to choose a Housing for your Sony:

**(why to choose the AV9
for your Sony V9)**

Size

at 14.9 lbs. the AV9 is the smallest.

Low Light Performance

2 Lux net sensitivity.

Depth Rating

250 ft.

Features

wide angle lens,
zoom control,
underwater microphone,
all-aluminum construction

Options

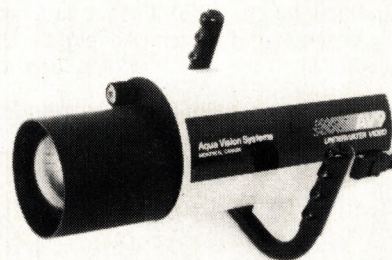
macro port, surface
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Price

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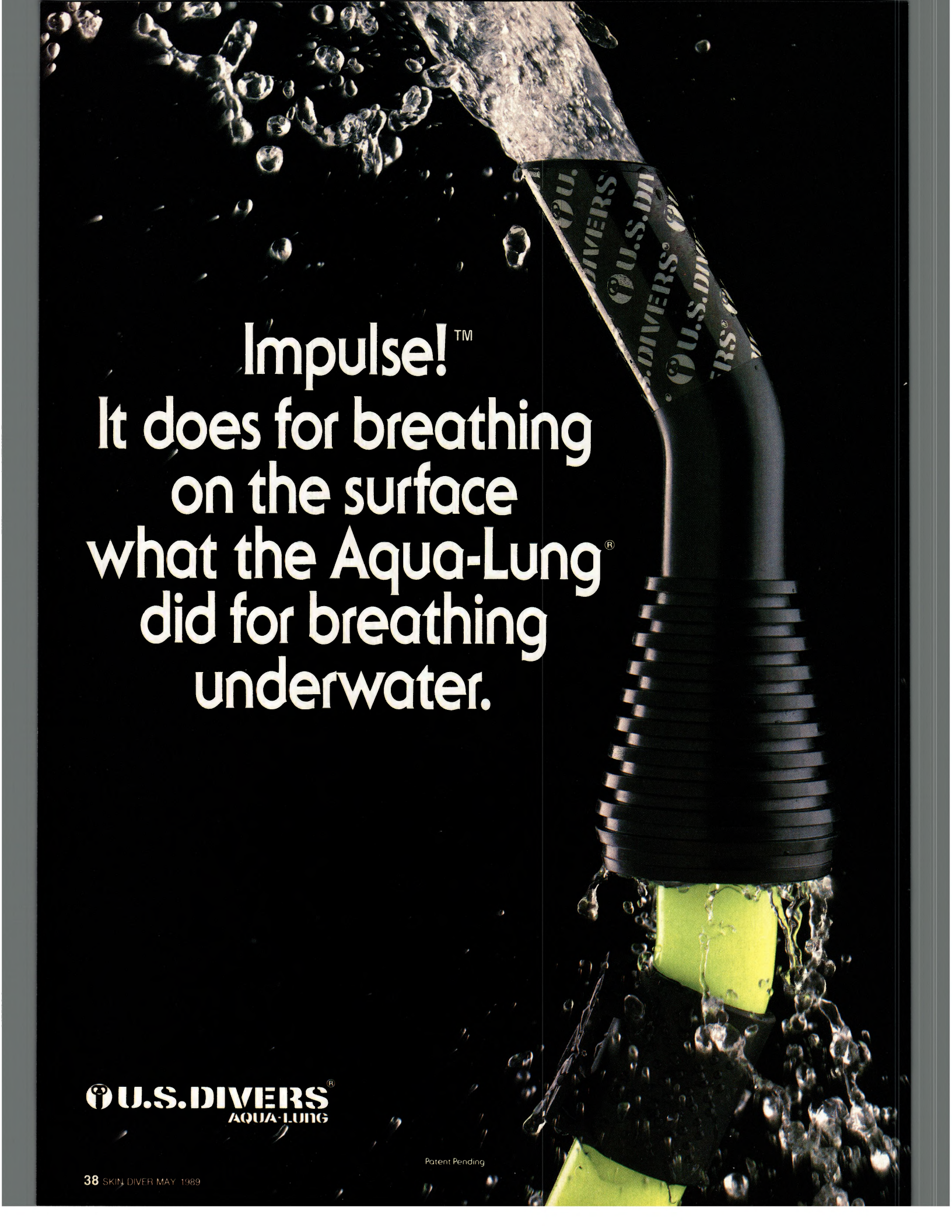
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ment, but important dive specifics many travel agents seldom have. You design the kind of vacation *you* want, when *you* want to go, because there are more than 130 competitively priced packages to choose from, for groups *or* singles. Reservations are a breeze too; your Dive Center places a single call to the travel experts at PADI Travel Network headquarters and personally handles your whole trip: hotel, airfare *and* diving.

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MESA El Mar Diving Center
PHOENIX Sundiver Pool & Watersports
TUCSON Aqua-Fun Scuba Center
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EL DORADO South Arkansas Dive Shop
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Sport Chalet Divers
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LOMPOC Water Sports
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MONTEREY Aquarius Dive Shop
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NOVATO The Pinnacles Dive Center
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& Dive Store
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Thunder Island Divers
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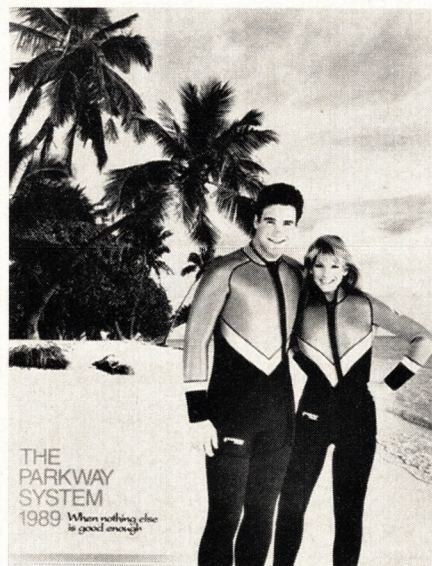
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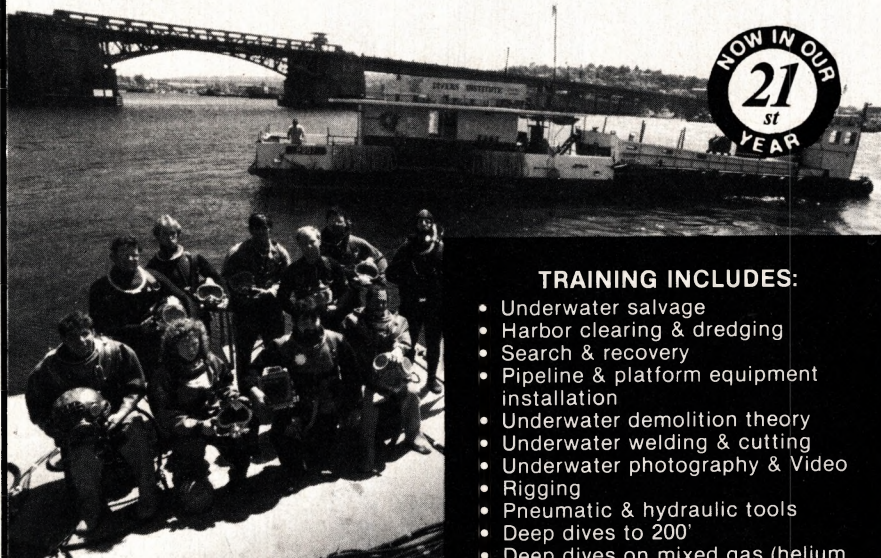
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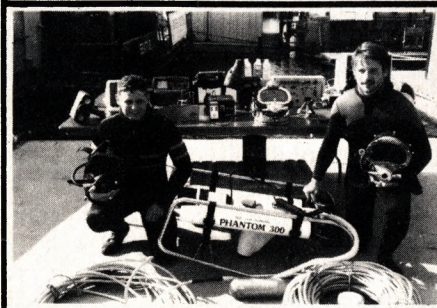
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TRI-STATE DIVE RETAILERS ASSOCIATION

Tri-State Dive Retailers Association is a conglomerate of more than 30 dive stores (and that number is growing rapidly) whose main goal is collectively promoting sport diving and bringing an awareness of the marine environment to the public. "We are not into politics or group buying," explained Bob Tseng, Tri-State's current president. "We owe our tremendous success to the fact that from the onset we proposed to band together in a totally non-competitive way."

At monthly meetings, the mood is indeed non-competitive. Participating dive store owners from New York, New Jersey and Connecticut share tips on marketing and advertising strategy, and work on group projects sponsored by DEMA. One such project was an evening with Jean-Michel Cousteau at Town Hall in New York City. Last year Tri-State designed and produced a multi-page color brochure promoting the fun and excitement of diving in the Northeast, which is distributed at recreational shows and exhibits, as well as in the individual stores.

Recently, Tri-State collectively bought a large 12 panel booth to be displayed at regional and national shows. The booth, boasting a fully lit photo of a diver swimming across the Manhattan skyline, has proved to be a show stopper. The booth will travel to many major shows and is also available for a nominal fee for individual use by any Tri-State member. When not actively in use, the booth will remain on display at the USS *Intrepid* Air and Space Museum in New York City.

Tri-State Dive Retailers Association is growing every year, with membership being sought from dive stores as far away as Pennsylvania and Massachusetts. For more information contact Tri-State Dive Retailers Association, Westchester Dive, 500 North Main Street, Portchester, New York 10573; (914) 937-2685. 🐠

NEW NAUI COLLEGE COURSES

In response to the growing demand for instructor training courses in resort areas, NAUI College has scheduled a number of new courses for the 1989-90 school year. These courses are designed to address issues related to the successful teaching of classes in resort environments.

For more information on the resort and California based career programs, prospective students are encouraged to call (800) 423-7095 or (800) 227-6663 in California. Financial assistance is available as is personalized placement assistance (by appointment). 🐠



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Three Key Shots

BY JIM CHURCH

PHOTOS BY JIM AND CATHY CHURCH

This lesson will show you how three key shots—the LS, MS and CU—can be used to structure and improve your underwater videos. These “building blocks” help you overcome two basic errors: (a) shooting a bunch of long scenes, all at the same camera to subject distance; and (b) shooting scenes in random sequences. Our subjects will be the sunken ships and artifacts in Truk Lagoon.

THE LONG DISTANCE SHOT

The LS (long distance shot) is usually a wide angle shot showing the overall view of a scene or subject. The actual distance and picture area, however, will vary with subject size. If the subject is extremely large, you may need an ELS (extreme long shot) to fit it into frame. An ELS of the bow of a sunken ship, for example, will have a larger area than a LS of a field gun on the deck of the ship. The LS has four main purposes:

1. A LS (or a ELS) is often used as an introductory shot to show an overall view of a setting and/or subject. For example, if you start your story topside, you might begin with a shot showing the dive boat. If you start your story underwater, you might use a shot showing a group of divers descending or swimming along a wreck, wall or reef. An introductory LS (or ELS) is sometimes called the “master shot” because it sets the scene for the action that follows.

2. A LS is used to reestablish the overall scene after a series of shots taken closer. For example, if you began a sequence of shots with a LS showing a pile of dishes on a wreck in Truk Lagoon, followed with a series of close-ups showing individual dishes, you might use another LS to bring the viewer's attention back to the overall scene before moving to another subject.

Reestablish whenever you add something new to the scene. If another diver enters the scene, use a LS to introduce the new diver. If your first shots showed only a second pair of hands, or a face, your viewer will be confused.

3. The LS is used to resolve present action and provide a transition to the action that will follow. For example, if you began with a pair of divers feeding fish and then moved in for a series of close-



Above: An introductory ELS sets up the video sequence. Right: A LS in a wreck's engine room leads to MSs and CUs.

ups, end with a LS showing the divers swimming away. This reestablishes the overall scene, resolves the action and provides a transition to your next shot—an introductory LS of the next activity.

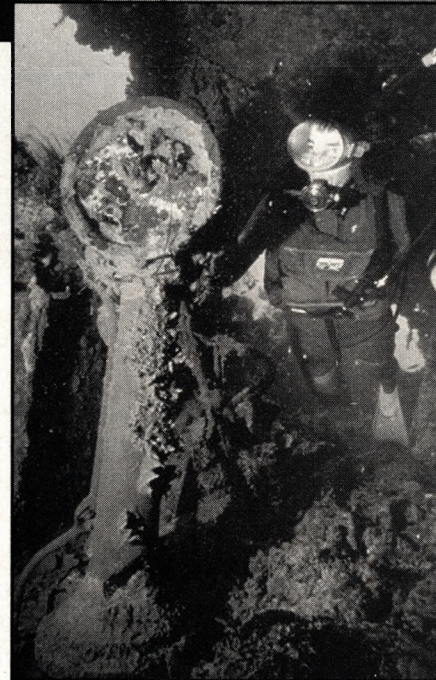
4. The LS is used as the ending shot in many U/W video movies. For example, a shot showing divers heading up the mooring line provides a strong ending.

THE MEDIUM DISTANCE SHOT

The MS (medium distance shot) shows only part of the overall scene introduced by the LS. The exact camera to subject distance and picture area varies with subject size. For a shot featuring a diver, a MS is usually framed from about the waist to just over the top of the head. For a large shipwreck, a MS may show one feature, such as a ship's wheel or engine telegraph. The MS has the following uses:

1. It identifies specific subjects or actions. For example, if you started with a LS showing three divers, short MSs identify individuals to the viewer.

2. It is a transition shot between the introductory LS and the close-up shots that follow. For example, a LS showing a distant diver approaching a wreck, followed by a close-up of the diver's hand touch-



ing an artifact, is too abrupt. One or more MS views of the diver searching for, and finding the artifact, smooths out the action and leads the viewer to the close-ups.

3. It emphasizes action. Whether it is fish feeding, finding artifacts or just clowning around, the MS is your “bread and butter” shot to show action.

THE CLOSE-UP SHOT

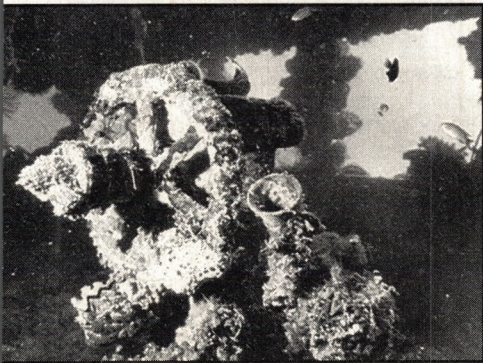
The LS and MS shots pave the way to a CU (close-up) view of the main subject or action. However, the term "close-up" can be misleading. While most U/W photographers think of close-up subjects as being small, a CU of a whale's face would be much larger than a CU of a tiny blenny. As with the LS and MS, camera to subject distance and picture area depend on the size of the subject. Use CU shots as follows:

1. Once the overall scene and action have been established, the CU shows the fish's face, the artifact in the diver's hand or the delicate tentacles of an anemone.

2. To add interest and variety. A video movie with nothing but LS and MS shots can be boring, especially if the divers are reacting with small subjects that the viewer can't see clearly.

3. The CU shot can also be used as an introductory shot. For example, imagine you are shooting a CU of an anemone. Then, after a few seconds, you pull the camera back one or two feet to show a LS of a diver approaching the anemone.

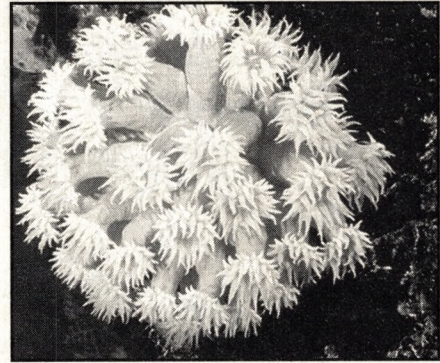
When shooting a series of CU shots, break them up with MS shots to reestablish the general scene. This adds variety. Use a MS to reestablish whenever you change close-up subjects; the MS connects the close-up views for continuity.



Above: A medium shot (of the telegraph) following the engine room long shot. Below: A close-up following the above MS.



Above: A long shot of Cathy Church and soft corals can lead to a CU series. Right: The CU can also be an introductory shot.



An underwater video containing nothing but long and medium shots can be boring. Close-up shots add interest and variety.

SHOT DESIGNATIONS

The designations—LS, MS and CU—are relative to subject size. Each time you start a new sequence of shots, the picture area of your introductory LS may be different. As examples, you might use an ELS (extreme long shot) to introduce viewers to a sunken ship in Truk Lagoon. Then, move in and introduce viewers to LS, MS and CU sequences featuring specific parts of the ship, such as ordnance and artifacts.

CREATING SEQUENCES

The LS, MS and CU are the building blocks for creating action sequences. This is how you should see and think: Start with an overall view, identify individual subjects and then concentrate on a single subject or action. End with an overall view to resolve the action.

The basic sequence of shots—LS, MS, CU and LS—can be used over and over again with many different subjects and situations. Once you have this sequence in mind, you will see it again and again in popular TV programs. However, you can break the basic sequence: You can add MS and CU shots; for example, you might use LS, MS, CU, MS, CU and LS. Or, you might begin with a close-up for a CU, MS, LS sequence. Think of the three basic shots as building blocks you can rearrange in any order that enhances your U/W video. The key idea is to avoid long scenes shot from one position. A series of short scenes shot at a variety of distances creates a more interesting story.

I often turn the camera off between shots to avoid camera movement as I change distances and angles. However, there will be times when you will want to keep the camera running. As examples,

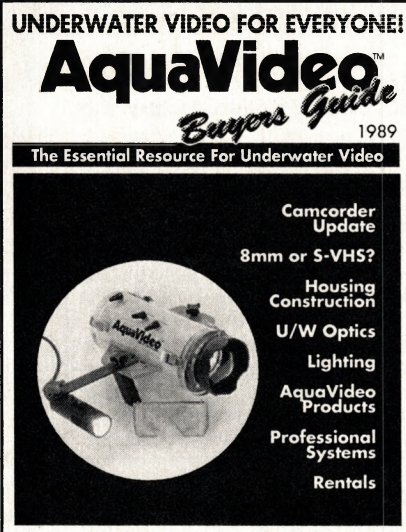
if you are using a gliding in approach, you can zoom in from a LS to a MS shot. Likewise, when shooting small subjects, moving the camera a foot or so closer or farther away from the subject allows you to zoom from MS to CU and CU to MS. While your camera may have a zoom control, moving the camera is often the smoothest and easiest way to zoom.

CONCLUSION

Mastering the three basic shots will help you get beyond the "point and shoot" stage of U/W videos. You will start structuring your movies around related action sequences. You will no longer just swim with the camera on, shooting

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VIDEO COURSE

a bunch of unrelated scenes. Practice using the basic shots in predictable situations—you can use your kids in a swimming pool. Most shots should be about



Dishes appear dramatic when shown with this MS (which will be followed by a CU).



A close-up following the MS of dishes.

five to seven seconds in length. Shorter or longer shots depend on the purpose of the shot and subject interest. If you are shooting divers in open water, discuss your basic story line with them ahead of time. Drawing simple stick figure diagrams often helps them visualize what you want them to do. ➤

EUBS SCIENTIFIC MEETING

The 15th annual European Undersea Biomedical Society (EUBS) scientific meeting will be held September 17-21 at the King Solomon Hotel, Eilat, Israel. Topics will include saturation diving, decompression, diving for the disabled, marine life hazards, free diving, narcosis, oxygen toxicity and many more. Panel discussions will cover hyperbaric oxygen therapy, methods for treating Type II decompression sickness and seasickness.

Several pre and post meeting tours have been scheduled to a variety of the area's magnificent and historical sites.

Special packages have been arranged with area hotels. For travel and accommodation information contact Kenes Tours, P.O. Box 50006, Tel Aviv 61500, Israel; 972-3-654-571. For program information contact Secretariat, EUBS 15th Annual Scientific Meeting, P.O. Box 50006, Tel Aviv 61500, Israel. ➤

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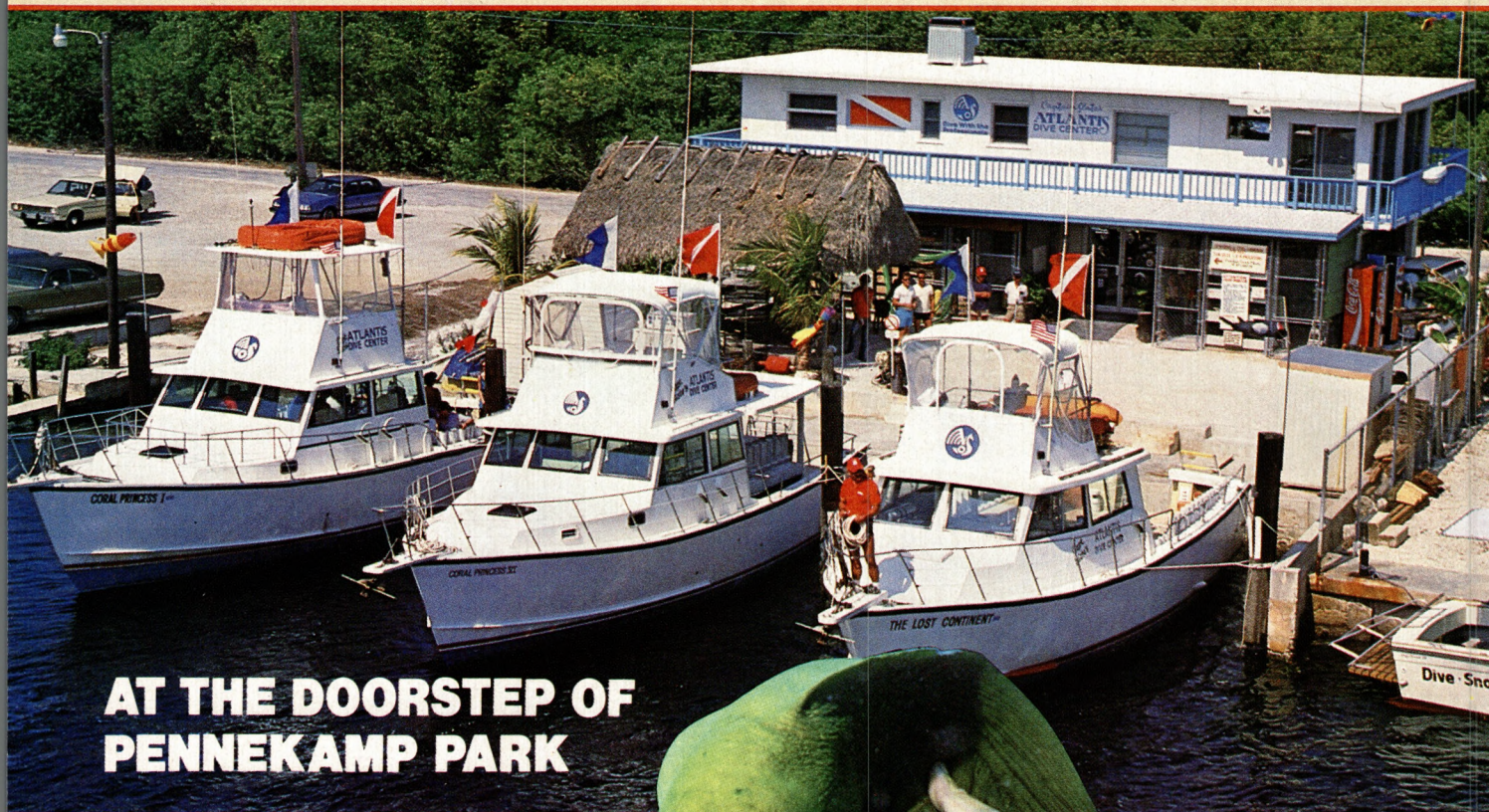
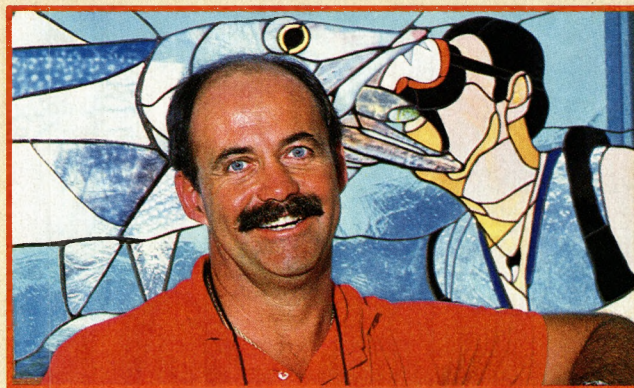
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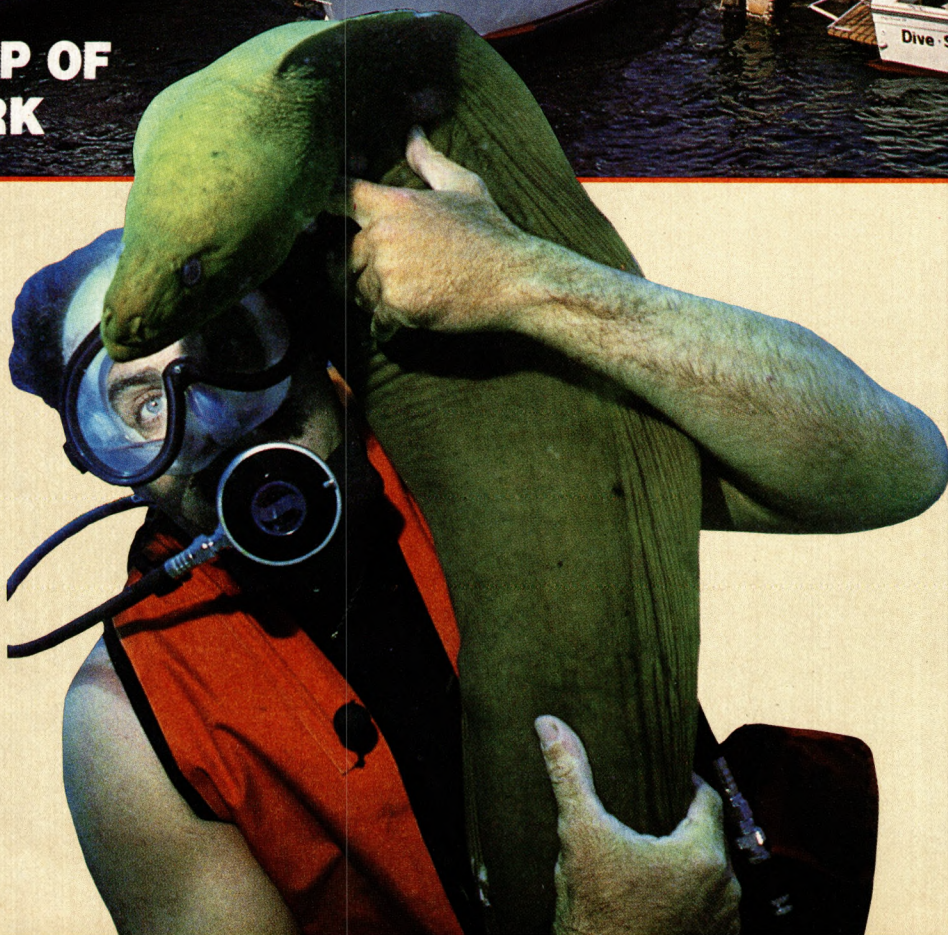


AT THE DOORSTEP OF PENNEKAMP PARK

TEXT AND PHOTOGRAPHY
BY STEPHEN FRINK

Key Largo, Florida is famous within the sport diving community as the home of the Key Largo National Marine Sanctuary and the adjacent John Pennekamp Coral Reef State Park. Because of the quality of diving offshore and the geographic convenience of the destination, Key Largo is the world's single most popular dive destination. Incredibly, as many as 750,000 divers visit these waters annually to enjoy the immense coral banks and shallow fringing reefs offshore. These coral structures are constantly washed by the crystalline currents of the Gulf Stream, bringing both nutrients and generally clear water. Marine life populations have flourished both as a function of nature and the intervention of man.

Key Largo has enjoyed the status of a marine preserve since 1960, so there has



been no spearfishing or coral collection to despoil the marine environment. Also, the sanctuary program has placed 120 mooring buoys at select reef and wreck sites to reduce the possibility of anchor damage to the fragile corals. Among the quality operations that have evolved to serve the needs of the traveling diver wishing to experience the offshore beauty of the Key Largo National Marine Sanctuary, Captain Slate's Atlantis Dive Center has emerged as a favorite.

There are multiple reasons for the success of Atlantis Dive Center. The first and most obvious is the quality of the available diving. Beyond that, Atlantis has created a most complete diving infrastructure for the convenience of its guests. Key Largo does not offer beach diving, in fact the best dive sites are five to six miles offshore. Therefore, boats are an integral component of any dive operation and Atlantis maintains the Upper Keys' most sophisticated dive boat fleet. Four of the boats are 40 foot, diesel powered, custom, deep-V fiberglass vessels built by Commercial Work Boats and designed from the keel up to maximize dive efficiency. The *Lost Continent*, *Coral Princess I*, *Coral Princess IV* and *Fred D* have all been set up with tank racks, walk-through transoms, dive platforms

with extended ladders, marine electronics and full diver safety equipment. In addition, the *Coral Princess IV* is also equipped with glassbottom viewing panels, an option especially popular for the frequent underwater weddings staged by Atlantis Dive Center. The 27 foot *Wreck Diver*, also a Commercial Work Boat custom designed for diver efficiency, completes the Atlantis fleet. Collectively, the Atlantis fleet can carry up to 136 divers at once and the versatility of the boats will suit most any charter need.

As we just noted, Atlantis conducts numerous underwater weddings each year and this unusual service has been well documented in the media (including *People* magazine). Amy Slate is a notary public empowered to conduct weddings and the Statue of Christ of the Abyss is a perfect site for the underwater ceremony. Besides the obvious religious connotation of the statue, it is in only 25 feet of water. This allows for lots of light and extended bottom time. Since Atlantis has been feeding the fish here for years, ample piscine guests are certain to be in attendance. Amy prints the vows on an underwater slate and a box is provided for the bride and groom to check off "I do." Be prepared to go through with it if you book an underwater wedding with Atlan-

tis, however. The underwater slate has no provision for "I don't!"

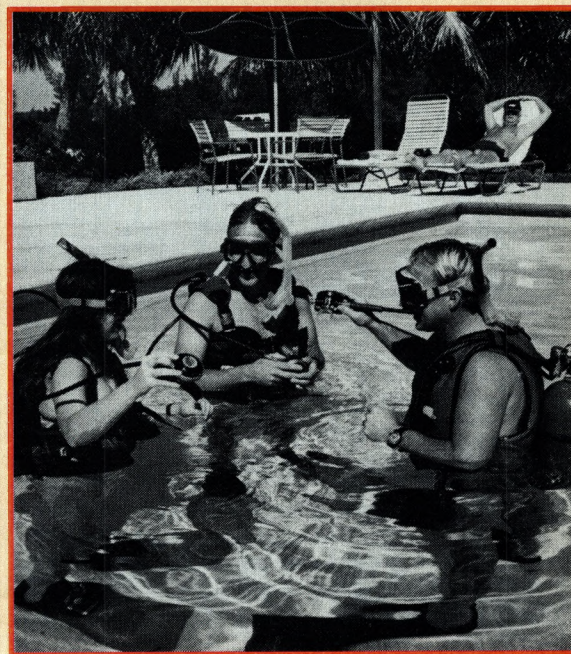
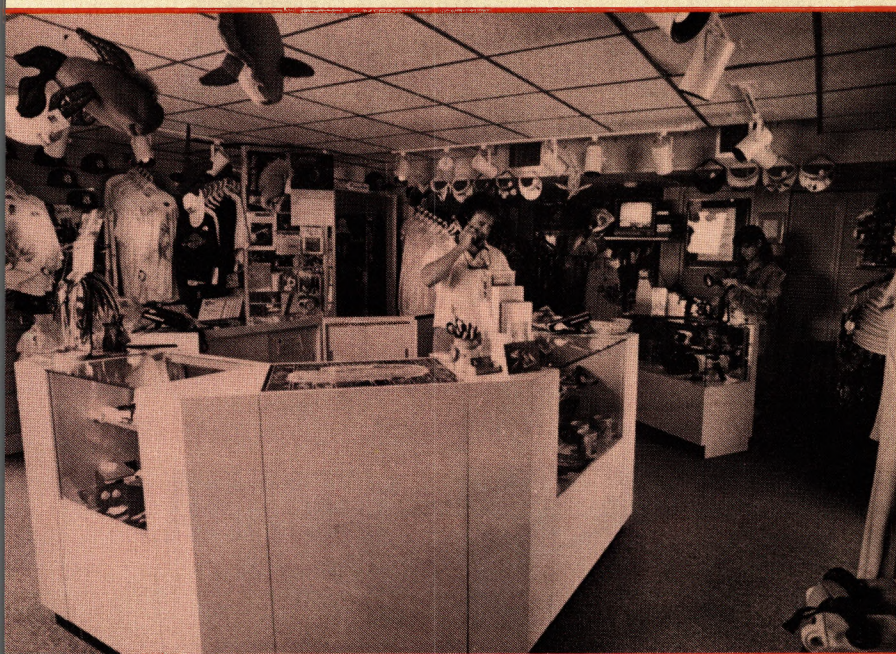
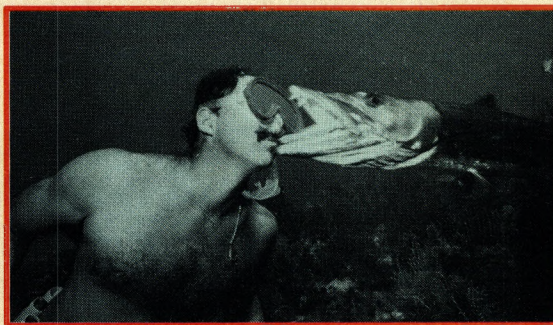
The normal schedule of dive boat departures includes an 8:30 morning trip and a 1:00 pm afternoon trip. Both divers and snorkelers can be accommodated on these two location trips and, since the reefs are generally shallow, both will enjoy the adventure. Special snorkel tours visiting just one location can be scheduled at 9:30, 12:30 and 3:30. For those with limited time or wishing to explore more of the topside attractions of the Florida Keys, these one location excursions are ideal. Of course, night dives are also offered regularly. Other elements fundamental to the dive operations include two massive air compressors (31 and 17 cfm) and 30,000 cubic feet of cascade air storage. Nearly 200 aluminum cylinders are kept in the rental inventory, with more than 100 sets of snorkel gear and 30 scuba outfits also available.

Scuba instruction is a primary consideration for the Atlantis staff and eight instructors are kept busy with open water scuba certifications under YMCA, NAUI, PADI and CMAS guidelines. In addition to the open water certifications and referrals from other instructors, the Atlantis staff offers resort courses through advanced open water and specialty courses including night, wreck, deep diving and underwater photographer.

Atlantis maintains two newly renovated dive centers. One is on the highway (U.S. # 1, the ground transportation artery of the Florida Keys), serving as a welcome and retail center. The second store is right on the mouth of a canal no more than 50 yards from the Atlantic Ocean. The highway store will be the first dive service on the left as you enter the Florida Keys. The main store, on the water, is the

(Continued on Page 190)

Opposite page, top to bottom: Spencer Slate; the Atlantis Dive Center; Captain Slate with a green moray at the *City of Washington* wreck. **Right:** While free diving, Captain Slate feeds a barracuda. **Below:** The interior of the Atlantis Dive Center. **Below right:** Scuba instruction in the pool at the Key Largo Howard Johnson Resort.





DIVING'S NEW HALL OF FAME

DEMA Presents The First Reaching Out Awards

BY BONNIE J. CARDONE

Diving now has its own Hall of Fame, instituted by the Diving Equipment Manufacturers Association (DEMA). Every year four people who have made extraordinary contributions to diving will be honored by induction in the Hall of Fame. Each will also receive a special statuette known as the Reaching Out Award. The first four inductees received their awards at the DEMA Show film festival in Las Vegas on January 27. According to Robert Gray, DEMA's executive director, "The 13th DEMA Show and the creation of the Diving Hall of Fame mark new milestones in the growth of the scuba diving industry. Scuba is now a mature recreational activity with a devoted and rapidly growing public following."

The Reaching Out Award is a handsome sterling silver statuette mounted on a polished rosewood base. The 14 inch high, four pound award depicts a diver kneeling on the sand with his hand reaching up to touch a passing manta ray. The statuettes were created especially for DEMA by Houston, Texas artist/diver/jewelry maker, Robert L. Straight, whose gold and silver jewelry reflects his 27 year love affair with the underwater world. The first four Diving Hall of Famers are Jacques-Yves Cousteau, Stan Waterman, Jack McKenney and Glen Egstrom.

JACQUES-YVES COUSTEAU/LIFETIME ACHIEVEMENT

A standing ovation greeted the man who must be considered the father of our sport when he appeared on stage to receive his Reaching Out Award. Is there a diver alive today who has not been influenced by Jacques Cousteau? How many have taken up scuba after being captivated by the exploits of *Calypso's* divers? The man who made diving possible—by inventing the first regulated compressed air breathing device (the Aqua-Lung) with Emile Gagnan in 1943—continues to be a major force in the U/W world today.

Cousteau was born in France in 1910. When he was 10 his parents were living in the U.S. and sent him to summer school in Lake Harvey, Vermont, where he learned to free dive. While a French naval officer near the Mediterranean Sea, he tried the small goggles used by Japanese pearl divers. He found the experience electrifying and it sparked an intense interest in staying underwater, which led to the development of scuba equipment. Once diving was possible, Cousteau wanted to share his experiences with others. In his own words, he put "cameras in watertight boxes and

(Continued on Page 54)



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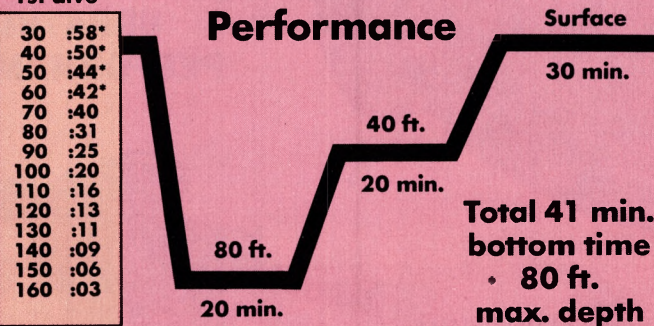


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Planning
before
1st dive

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40	:50*
50	:44*
60	:42*
70	:40
80	:31
90	:25
100	:20
110	:16
120	:13
130	:11
140	:09
150	:06
160	:03

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Pre-Dive
Planning
before
2nd dive

30	:58*
40	:50*
50	:44*
60	:31
70	:24
80	:19
90	:15
100	:13
110	:11
120	:08
130	:05
140	:02
150	—
160	—

*Bottom time based on air with average breathing rate

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SKIN DIVER MAGAZINE
1989
Bestseller
Series
SCUBA
REGULATORS

In January Oceanic introduced a brand new regulator called the Delta and the company is predicting it will soon become a bestseller.

One has to wonder how Oceanic could come up with a truly innovative regulator when there are more than 55 different models already on the market. Well, Oceanic has done it—the Delta is indeed radical. It looks different, operates differently and performs like a champion.

Designed as the regulator of the 1990s, the Delta possesses a very distinctive look that immediately captures your attention. The second stage is a futuristic blend of softly rounded contours and smooth flowing lines. Constructed of space age Noryl, the exterior surface has a black satin finish that projects the image of a professional scuba system.

Unveiled at the DEMA trade show, the Delta has been described by many dive store dealers as having the sexiest looking second stage in the business.

Oceanic never intended the Delta to get by on good looks alone. Its major feature is a new kind of manual adjustment knob that can fine tune the breathing re-

sistance of this high flow regulator. The large black knob on the left side of the mouthpiece allows the diver to increase or decrease breathing resistance at a twist of the hand. The knob can be rotated six full turns, thus offering an incredibly wide range of adjustment. Breathing resistance can be varied over a much wider range than that of any other adjustable second stage on the market today.

You might wonder why a diver would ever need an adjustable second stage regulator, but the answer is simple: Diving conditions can vary greatly, depending on the environmental situation, physical effort being expended and preferences of the diver involved.

For example, divers want a very easy breathing regulator at depths, but dislike the annoyance of a freeflowing second stage while making a snorkel swim on the surface. The Delta offers the best of both worlds. The diver can increase breathing resistance during a surface swim by cranking the adjustment knob clockwise and eliminating freeflow. Once the diver begins to descend, the control knob can be readjusted for much less breathing resistance and an easy flow of air.

Other environmental situations that might require increased breathing resistance would be: being towed by a diver propulsion vehicle; hanging onto an anchorline in a strong current; and so on. Unwanted freeflow can be quickly and easily curbed.

There are also times when a diver is working so hard that he or she might prefer a slight freeflow to ease breathing effort. This is where the Delta really excels as its breathing resistance can be reduced to virtually zero.

KEY FEATURES

- Hand adjustable second stage
- Downstream lever with roller bearing
- Silicone diaphragm and exhaust valve
- Orthodontically designed silicone rubber mouthpiece
- Built-in Noryl exhaust tee
- Multi-positional first stage
- Balanced piston first stage
- Stainless steel flow-through piston
- 360 degree swivel LP ports
- I.C.E. environmental protection cap

The Delta's adjustment mechanism allows for minute compensation of intermediate stage pressure fluctuations caused by tank pressure drop or first stage valve wear. The regulator is always tuned for peak breathing performance.

While the concept of an adjustable second stage has been around for a long time, the Delta is the first sport diver regulator of this type. To produce it, Oceanic adopted a design that has been used successfully in commercial diving for many years.

If you unscrewed the front cover of the Delta and looked inside you would find the classic downstream lever action valve system. The only thing Oceanic has done here is to add a roller bearing to the tip of the lever, thus eliminating friction and improving the smoothness of operation.

The lever action valve and poppet spring are untouched by the manual adjustment knob as this device is actually a separate assembly. What is quite different about the Oceanic lever action valve is that it has a light spring with approximately 70 psi resistance. Most lever ac-



**A PRO REGULATOR
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BREATHING
PERFORMANCE**



TEXT AND PHOTOGRAPHY
BY GERI MURPHY

Delta octopus second stage

COMPARISON OF OCEANIC REGULATORS

FIRST STAGE							SECOND STAGE								
Model	Price	Internal Design	External Design	HP Ports	LP Ports	Environmental Seal	Hose Diameter	Case/ Cover	Colors	Valve Design	Air Exhaust	Exhaust Valve	Mouthpiece	Warranty	Comments
Omega II	\$303.50	Balanced flow-thru, stainless steel piston	L-shaped LP ports swivel 360 degrees	2	4	Silicone filled cavity	Standard 3/8"	Lexan	Black, blue red, yellow pink, clear, turquoise, orange	Servo-assist downstream, bi-radial diaphragm/ exhaust valve	Left side	Blue silicone	Clear silicone	Limited lifetime, parts included	Super high performance regulator for sport or professional divers. Dependable, easy to maintain, compact. Unique size, shape and colors.
Delta	\$246.50	Balanced flow-thru, stainless steel piston	L-shaped LP ports swivel 360 degrees	2	4	Silicone filled cavity	Standard 3/8"	Noryl	Black w/blue, red, yellow and black purge stickers	Diver adjustable demand valve with spring override, roller demand lever	Under chin	Black silicone	Clear silicone	Limited lifetime, parts included	High performance regulator for sport or professional divers. Diver adjustable. Dependable, easy to maintain. Ultra modern design.
Alpha I	\$199.50	Balanced flow-thru stainless steel piston	L-shaped LP ports swivel 360 degrees	2	4	Silicone filled cavity	Standard 3/8"	Noryl case Lexan cover	Black, blue red, yellow, pink, lavender turquoise, gray and orange	Downstream demand with high-angle lever design	Under chin	Blue silicone	Clear silicone	Limited lifetime	All purpose small, lightweight regulator for general sport diving. Smooth breathing, dependable, easy to maintain.

tion second stages are fitted with a heavier spring of 140 psi resistance. Oceanic makes up the difference with a second helper spring that is part of the adjustment knob. The helper spring pushes against the end of the poppet valve stem, thus avoiding any interference with the diaphragm lever or primary spring. It can increase valve resistance from 70 psi up to 140 psi—providing a wide range of breathing resistance adjustment.

When the dive is over and the Delta is being readied for storage, the adjustment knob is unscrewed as far as possible to reduce tension on the poppet valve. This is the equivalent of a purge button depressor lock.

The Delta second stage is very easy to operate and requires little or no instruction. Once underwater, you simply back off the adjustment knob (turn counter-clockwise) until the regulator begins to freeflow lightly. Then, turn the knob back one-half turn. You now have manually tuned the regulator to the laboratory equivalent of one inch water column cracking pressure. Cracking pressure is the amount of effort required to initiate flow and one inch water column is con-

sidered to be a very low breathing resistance. When properly adjusted, the Delta breathes like a dream.

In addition to the manual adjustment knob, the Delta has a number of other interesting features. The interior of the second stage case is very smoothly contoured and air flow is channeled into the mouthpiece by a directional venturi flow vane. The exhaust tee is made of the same tough Noryl space age thermoplastic as the case. In fact, one-half of the exhaust tee is molded right into the rear portion of the regulator case. The other half is assembled with the aid of four stainless steel screws. The second stage is equipped with a black silicone breathing diaphragm that is very supple (for pressure sensitivity) yet extremely durable. The exhaust valve is made of the same black silicone material. The regulator has an orthodontically designed clear silicone mouthpiece that compensates for overbite. It is extremely comfortable, very soft and yet provides a good grip.

The first stage of the Delta is identical to the first stage of the more expensive Omega II regulator. This is Oceanic's top of the line model with servo-assist sec-

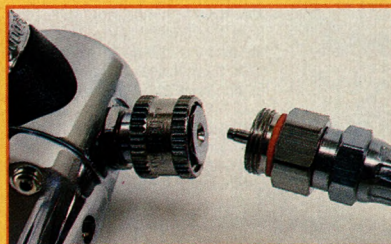
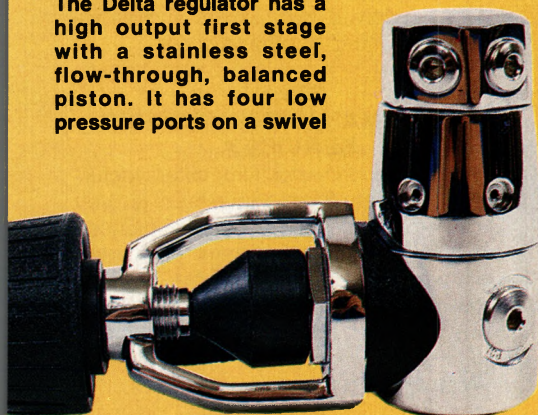
ond stage and side exhaust. This is a high quality, high output first stage with a stainless steel flow-through balanced piston that can put out a lot of air. It has four low pressure ports on a 360 degree rotating swivel for convenient hose positioning.

If you are searching for a truly unique regulator that lets you adjust the breathing performance for your own personal needs, the Delta may be just the ticket. It not only looks good—it feels good.

The Delta retails for \$246.50, making it Oceanic's mid-priced model, halfway between the Alpha I and the Omega II. We think it is Oceanic's best buy for the money and certainly the most unique. You can purchase an octopus second stage with the same adjustment feature for an extra \$103.

If you would like to know more about the Delta, stop in at your nearest authorized Oceanic dive store dealer and request a demonstration. For the name and address of the Oceanic dealer closest to you, contact: Oceanic USA, 14275 Catalina Street, San Leandro, California 94577 or call (800) 458-8880 or (415) 352-5001.

The Delta regulator has a high output first stage with a stainless steel, flow-through, balanced piston. It has four low pressure ports on a swivel



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Black Max II console



Datamaster Sport dive computer

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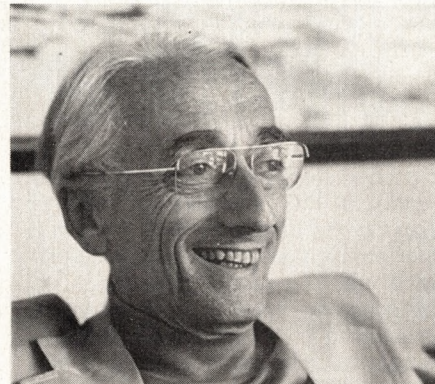
DEMA HALL OF FAME

(Continued from Page 50)

started filming."

In 1950, Captain Cousteau acquired a World War II American minesweeper. Renamed the *Calypso*, it was converted into an oceanographic vessel supported by a Cousteau creation, the Campagnes Oceanographiques Francaises, a non-profit oceanographic research and development association.

In 1951, in collaboration with Andre Laban, Cousteau perfected the first underwater camera equipment for television



photo/Jack McKeeney

Jacques-Yves Cousteau

transmission. That same year, U.S. Divers Company was formed to manufacture and sell the Aqua-Lung and other underwater equipment.

Originally, Cousteau devoted himself to observing and recording the underwater world. Then he began noticing the detrimental changes that were occurring to it. He became convinced that oceans were endangered bodies of water and that, because his survival was so linked to them, man was an endangered species. This led to the creation of The Cousteau Society in 1973.

Cousteau helped invent the first diving saucer in 1959. He conducted saturation diving experiments from 1962 to 1965 in Consheif I, Consheif II and Consheif III.

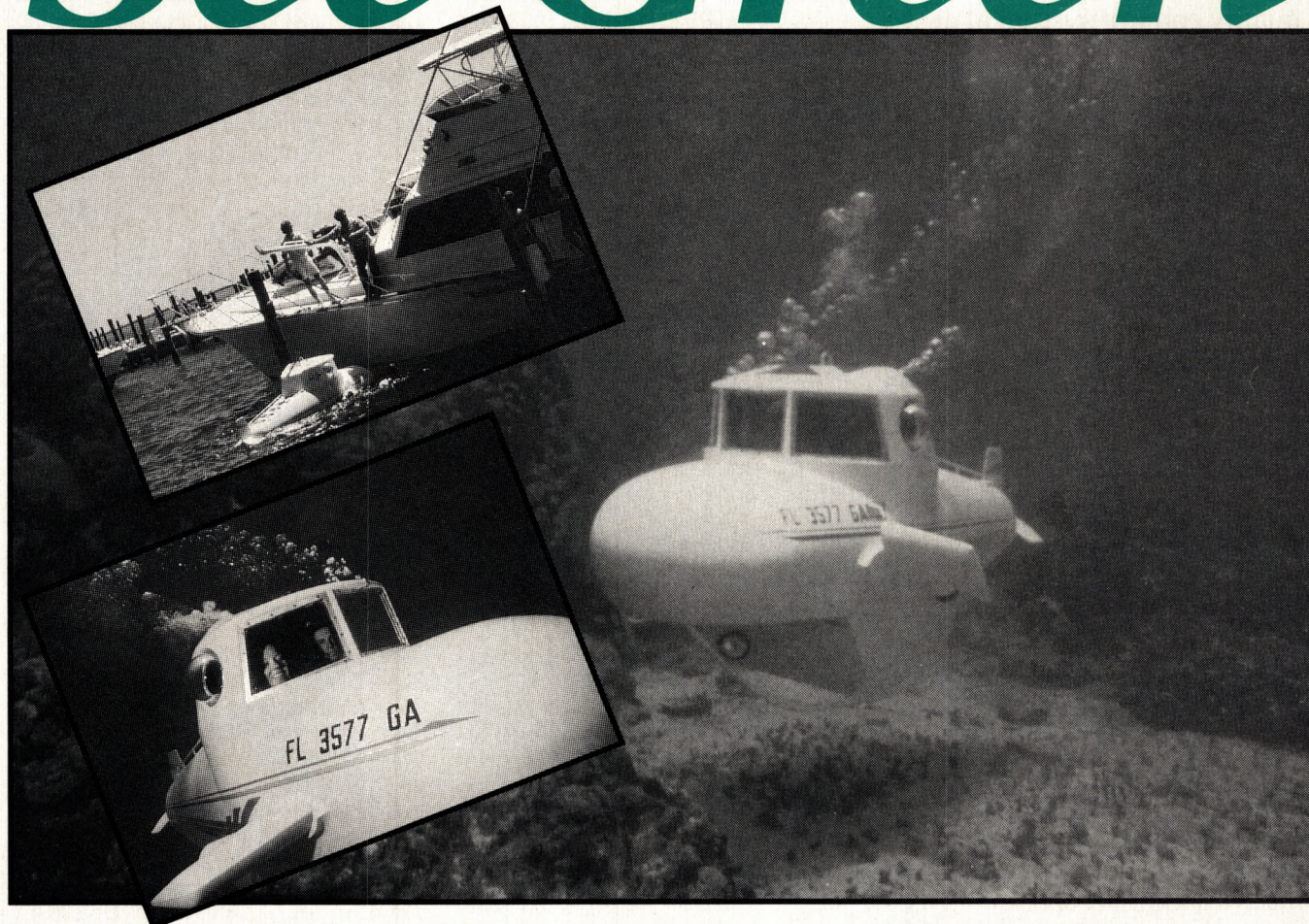
Cousteau has produced more than 50 films for television and three full length theatrical feature films. He has written, alone or with others, more than 50 books. He has received two Oscars and an incredible number of other awards.

STAN WATERMAN/DISTINGUISHED SERVICES

Pioneer underwater filmmaker, lecturer, storyteller, Stan Waterman is well known to scuba film festival audiences worldwide. He has always just been somewhere interesting and his descriptions of his experiences—as portrayed in his films—are a refreshing mix of wit and wisdom.

Waterman's 22nd film, *Sharks*, debuted at the DEMA film festival. His work

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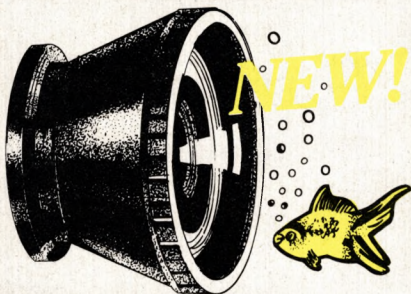
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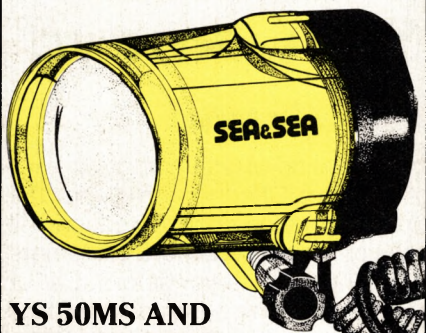
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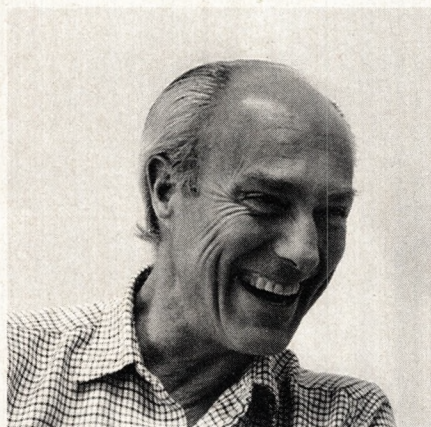
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DEMA HALL OF FAME

has earned him numerous awards over the years, including three Emmys for cinematography. The first (1982) was for his work on ABC's *The American Sportsman Show*; the second (1987), for *Three-Two-One Contact* on PBS; the third (1988), for ABC's *Spirit of Adventure*.

Stan was born in New York City in 1923. While vacationing with his family in Palm Beach, Florida in 1938, he got his



Stan Waterman

first glimpse of the U/W world through the faceplate of a Japanese mask.

Waterman received a B.A. in English from Dartmouth in 1946. His college career had been interrupted by WW II and a stint in the navy. While serving in the Canal Zone, he learned breath-hold diving from two California lobster divers.

After the war, Waterman spent a year at Columbia doing graduate work in political science. Deciding this was not really to be his life's work and in a back-to-Walden-Pond frame of mind, he settled in Maine, becoming a blueberry farmer. Soon after he read about the Aqua-Lung in *National Geographic*. Before long he had his own scuba unit (the first one in Maine), his own compressor and an underwater salvage and recovery business. He gave up blueberry farming for good in 1954, moving to the Bahamas to become one of Nassau's first dive operators.

Waterman made his first movie in 1957. He sent mailers to prep and boarding schools and 16 dates to show *Water World* were the results. He has been making films and traveling the world to show them ever since. He has also been an underwater cameraman for seven feature movies, including *Blue Water, White Death* and *The Deep*, and eight TV network segments.

JACK MCKENNEY/THE ARTS

Jack McKenney's Reaching Out Award was accepted by his children, John and Kim and his wife, Pam. The scuba world was stunned to hear of McKenney's

death in December. He had just turned 50. Few people in the industry were so loved. Jack's passion was producing underwater motion pictures. He wrote, directed, filmed and edited his movies. Each was given all of his energy, which was considerable. He was noted for his perfectionism, demanding the best not only from himself, but also from all who worked with him. His films are informative, entertaining and truly unique. Humor and special sound effects are McKenney Productions trademarks.

Jack was already a well known, prize winning underwater filmmaker and still



Jack McKenney

photographer when he joined the staff of *SKIN DIVER* in 1968. Born in Windsor, Ontario, Canada on October 4, 1938, he began diving in 1952 in freshwater quarries and the Great Lakes. He became a NAUI instructor in 1963. In 1965 he moved to the Bahamas and was one of the original staff members of Freeport's Underwater Explorers Society. After three years as a program director, instructor and guide with UNEXSO, McKenney moved to Southern California to become associate editor of *SKIN DIVER*. He became editor in 1972.

While at SDM, Jack traveled the world, writing about his experiences and photographing them for the magazine. He also continued to produce this own underwater motion pictures.

Jack left SDM in 1976 to work full time as an underwater cinematographer. There were a few stints as underwater cameraman for others (*Shark's Treasure*, the *Andrea Doria* TV special and the Cousteau TV special on the Falkland Islands) but what Jack liked best was making his own films, where he had complete creative control. One of his last films, *The Stingray Man*, premiered at the DEMA film festival. His final and finest film, *Under the Emerald Sea*, was a Nature segment on PBS TV in February.

GLEN EGSTROM/DIVING SAFETY AND LEGISLATION

A pioneer diving educator/safety expert, Glen Egstrom was born in North Dakota on October 16, 1928. During the

summers of his teenage years he earned money free diving for outboard engines and fishing tackle lost by fishermen in Minnesota lakes as well as acting as a diving waterfront officer for the YMCA.

Egstrom received his B.S. in physical education from the University of North Dakota in 1950. He was drafted in 1951. While in Korea with the Air Force he tried scuba for the first time. He took up diving in earnest in 1954 when an uncle gave him a set of twin tanks and a double hose regulator. He attended UCLA, receiving an M.S. in physical education from that school in 1957. His Ph.D. in physical edu-




photo/Bonnie J. Cardone

Glen Egstrom

cation/human performance research was received from USC in 1961. That same year he was certified by L.A. County. He became an instructor with that organization three years later.

Glen began teaching at UCLA during his graduate days. Currently he is professor of kinesiology, with responsibilities that include courses and graduate seminars in applied anatomy, exercise, underwater and environmental physiology, aquatic kinesiology, biomechanical analysis and conditioning for optimal performances. He has been campus diving officer since 1964 and operates a major scuba diving training program at the university. He is director of the U/W Kinesiology Laboratory and principal investigator for the diving safety research project, which evaluates equipment, emergency procedures and training methods.

Although his duties at UCLA are extensive, Egstrom has been involved in many other scuba related activities. He has been a member of the Undersea Medical and Hyperbaric Society since 1970; a fellow of the American College of Sports Medicine since 1961. He has been very active in both L.A. County and NAUI. He has been a member of the American Academy of Underwater Sciences since 1980 and is the president of that organization this year.

Glen has been honored extensively. He has received two NOGI awards, the Conrad Limbaugh Award, the Leonard Greenstone Award and the Oceaneering International Award—among others. 



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Photo by Noel Rutt

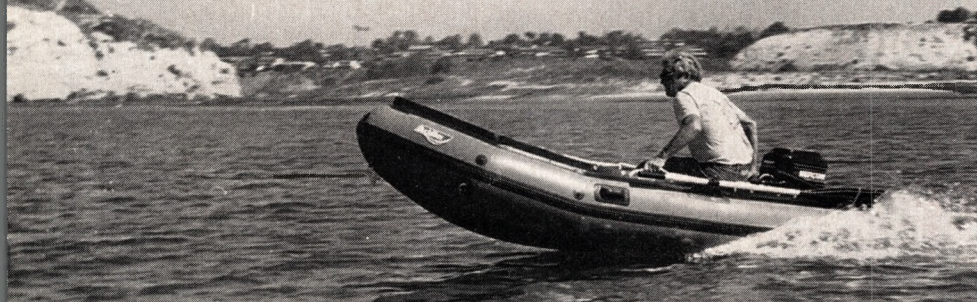
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SKIN DIVER MAY 1989 57

ACHILLES SD-130



The Achilles SD-130 is a medium size inflatable that, because of its wide diameter flotation tubes, can carry extra payload.

A Close Look At A Versatile Performer

TEXT AND PHOTOGRAPHY BY GEORGE COZENS

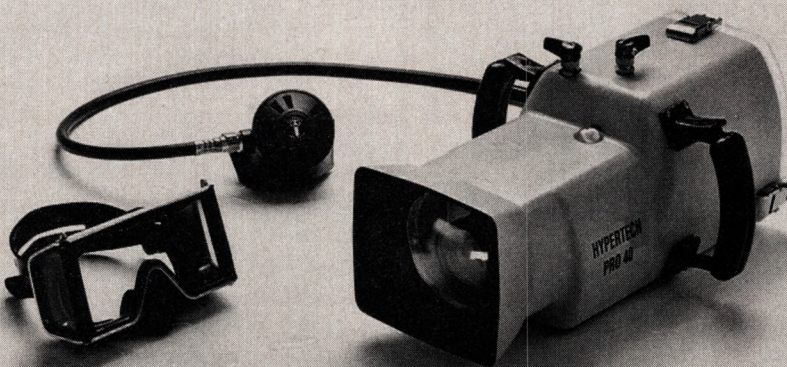
As Scott McIntosh puts it, the Achilles SD-130 is the biggest of the small boats. This isn't meant to be a contradiction in terms. Scott, proprietor of Port-A-Marine, a Costa Mesa, California, dealership specializing in the sales and service of inflatable boats, has years of experience and a wealth of knowledge in this field. In brief, Scott knows inflatables, and his description should be important to anyone who is interested in optimizing the versatility of a medium size inflatable.

Comparing the specifications in our chart should demonstrate what Scott means. The SD-130 holds a unique position in the Achilles line. It is the only 13 foot boat Achilles produces. With an overall length of 13' 2", it is 8 inches longer than the slightly smaller SD/SK-124 models (featured in the March '89 SDM) and 10 inches shorter than Achilles 14 foot models. More importantly, with its larger tube diameters the SD-130 can carry a total of 1,910 pounds—370

pounds more than the SD/SK-124 models, but only 30 pounds less than the 14 footers. This 370 pound increase in loading capacity translates to two more passengers or heavier equipment and materials. That's a lot of additional buoyancy, considering the SD-130 is just 16 pounds heavier than the 124s. Stated another way, the SD-130 retains all the advantages of a small to mid-size inflatable. It can be stored in a compact space. Its relatively light weight and small deflated

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Photo by Steven Cook

size allow for good portability. It can be assembled and disassembled quickly by one or two people. And, because of these features and its resilience and shallow draft, it can be launched and beached on almost any shore.

Some of you faithful SDM readers (at least those of you with good recall) might remember a suggestion concerning the selection of an inflatable boat that I quoted in the my last article. The recommendation, from *The Complete Book of Inflatable Boats*, by CDR Don Hubbard (U.S. Navy, retired), was quite simple: Select the size of an inflatable based on the conditions of your primary use, and let "the tremendous reserve buoyancy of the inflatable . . . accommodate an occasion-

al extra payload." This advice was true in the case of the SD/SK-124 and it certainly is valid for the SD-130. In the latter case, however, the "extra payload" can approach the one ton limit should it ever be needed.

Let's take a closer look at the Achilles SD-130. This boat has four air chambers in the tubes and one in the keel. The sectional floorboards are made of heavy duty marine plywood finished with high gloss varnish. Divers would do well to cover this decking with indoor/outdoor carpeting, for skid and abrasion resistance. As of this year aluminum floorboards are no longer available on Achilles SD models.

The SD-130 exhibits the same fine construction as that seen in other Achilles

boats we've reviewed. The tube and bottom material starts with a fabric woven of 840 denier nylon—to which is added, in successive calendering operations, two inner layers of neoprene (for airtightness) and one outer layer of Hypalon (for resistance to the ravages of nature and man). Calendering is the process of forcing the neoprene and Hypalon compounds into and onto the nylon fabric with rollers under high pressure and with heat.

After being cut to the proper shapes, adjacent pieces of material are bonded together with a one inch overlapped seam, which is then reinforced with seam tape inside and out. The solid fiberglass reinforced transom, rated for a maximum

(Continued on Page 62)

COMPARISON OF SMALL ACHILLES INFLATABLES

Model	Overall Length	Inside Length	Overall Beam	Tube Diameter	Weight	Load Capacity	Passengers	Engine HP	Air Chambers	Suggested Retail Price	Floorboard Material	Comments
SD-124	12'4"	7'9"	5'4"	17.0"	150 pounds	1,540 pounds	5	20-35	4 + air keel	\$2,550	Wood	Suitable for 2-4 Divers*
SK-124	12'4"	7'9"	5'4"	17.0"	160 pounds	1,540 pounds	5	20-35	4 + air keel	\$3,050	Aluminum	Suitable for 2-4 Divers*
SD-130	13'2"	8'2"	5'6"	17.7"	166 pounds	1,910 pounds	6	20-35	4 + air keel	\$2,830	Wood	Suitable for 4-5 Divers*
SD-140	14'0"	8'8"	5'6"	17.7"	190 pounds	1,940 pounds	6	30-50	4 + air keel	\$3,050	Wood	Suitable for 4-5 Divers*
SK-140	14'0"	8'8"	5'6"	17.7"	195 pounds	1,940 pounds	6	30-50	4 + air keel	\$3,795	Aluminum	Suitable for 4-5 Divers*

* Depending on trip distance, water conditions, amount of equipment, etc.



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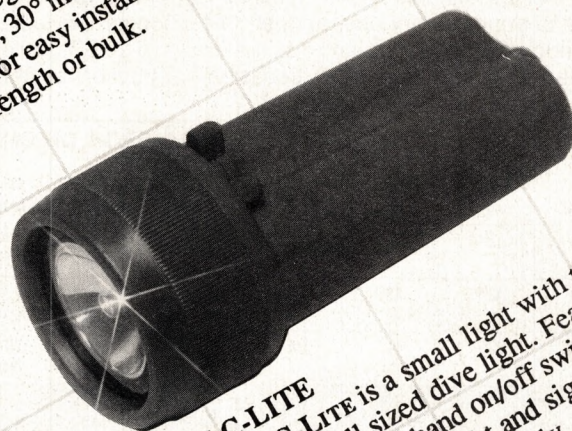
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PRO COMPASS

The IKELITE PRO COMPASS continues to lead the way. Features counter-clockwise degree markings, direct reading, low profile case and North indicator, 30° markings and bezel prongs are luminescent. Available with hose mount for easy installation on pressure gauge hoses for quick access without adding length or bulk.



MINI C-LITE

The MINI C-LITE is a small light with the intensity of a full sized dive light. Features small size, easy one hand on/off switch, interchangeable flash-light and signal strobe modules, with a virtually indestructible outer case, waterproof to 300' (90m).

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MODULAR LITES

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MODULAR SUPERLITE, top of the line light offers two intensity settings, the ultra-intense spot beam lasting 1 hour per charge and the broader flood beam lasting two hours per charge.



TTL SUBSTROBES

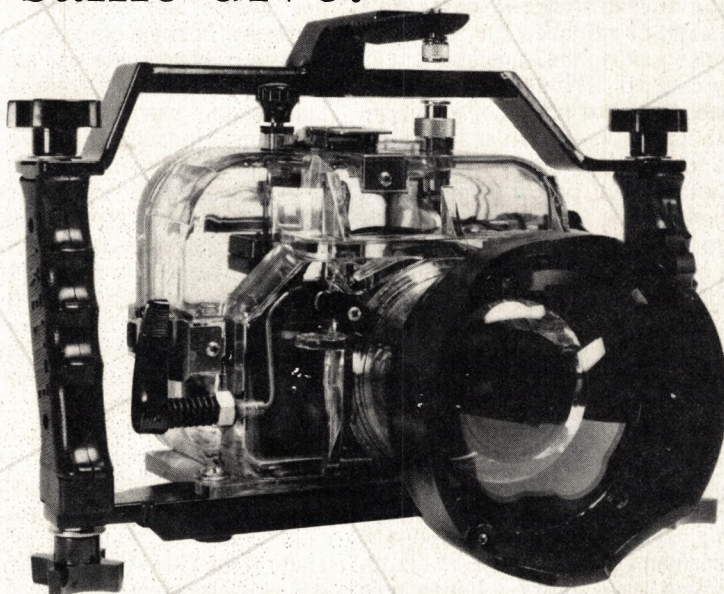
Ikelite's TTL SUBSTROBES are unparalleled as the best value for the underwater photography dollar. Lighting from macro to extreme wide angle, modeling lights, quick recycle, improved color temperature and an audible information system are only a few of the features offered by Ikelite.

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SLR-AF Case shown with New Top Handle featuring a center grip for carrying above water, mounting area for gauges and provides mount for Nikonos V.

SLR AUTO FOCUS

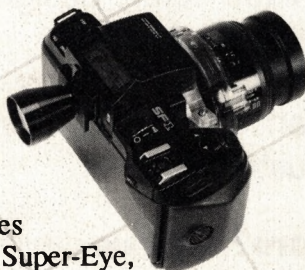
Combining the Ikelite SLR-AF Case with the revolutionary new auto focus SLR cameras opens a new world of photography to divers. No underwater photography system is as easy to use, as accurate, as versatile, or as reasonably priced.

The view thru-the-lens is the actual picture being taken. Simply depress the shutter button while the lens auto focuses on the subject to take the picture. The camera's TTL flash system controls the light output from the Substrobe for perfect exposures every time.

Many zoom lenses allow you to select wide angle, normal focal length, telephoto or macro at any time. On one dive photographers can now take a wide angle shot of dive buddies, normal shots of medium size fish, telephoto shots of shy creatures and macro photos of tiny marine subjects. Simply look thru the viewfinder and adjust the zoom to the picture desired. The auto focus and TTL do the rest.

IKELITE SLR-AF CASE

The Ikelite SLR-AF Case offers several new features over the older style case. Installation is quick and easy. With auto focus, no lens focus clamps are required (except zoom lenses) and only a couple of models require aperture clamps. Most cameras do not have to be removed for changing film, with many offering motor film rewind. These cameras have motor drives, so no film advance lever is required.



Super-Eye

All AF Cases include the Super-Eye, which shows corner to corner viewing thru the camera viewfinder. Controls are provided for focus/shutter release, aperture, exposure mode, and zoom.

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SLR-Auto Focus FACTS.....

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ACHILLES SD-130

(Continued from Page 59)

engine size of 35 hp, is equipped with aluminum engine mounting plates and a self-bailing drain for the bilge.

The outboard sides of the tubes are protected from abrasion by a wide, molded rubber rubbing strake, which runs the entire length of the tubes. On top of the tubes, also running their entire length, is a spray deflector. The aft half of this deflector serves as the lacing cuff for the life lines. There are three interior bow rings inboard for equipment tie-downs. If additional attachment points for securing equipment are needed, they can easily be added by merely installing a few well placed grommets anywhere in the spray deflector. Still more tie-downs can be installed directly in the floorboards.

Don't worry about securing the fuel tank—fasteners for this are part of the standard package. And, while we're on the subject of attachment points, I should include the dual lifting handle/towing ring low on the bow, one towing ring on each side just aft the bow, the four molded rubber lifting handles (two on each side) and the helmsman's grip. This last item is especially nice. It is a molded rubber handle on the inside of the starboard tube that gives the helmsman a comfortable and secure place to hold onto when operating


the boat in sloppy seas, etc. And, when the wind or seas do get a little nasty, a standard removable bowdodger can keep equipment in the bow a little drier.

In case of engine failure, or for silent running, oars are included, too. These are mounted in molded rubber oar locks, designed by Achilles. When stowed, the oars are secured to the outboard sides of the tubes. After releasing the elastic cords that hold the blade tips, these oars can be pivoted in the oar locks to their rowing positions. It is reassuring to know that the oars can't be lost overboard inadvertently, because they are held captive by a pin in the oar lock. Although out of the way for most aquatic activities, the oars in the stowed position might present a minor problem for divers entering or exiting the boat. Not to worry. This difficulty can be resolved by letting the oars "hang" free (in the rowing position) during entries and exits or they could be removed and placed on the deck, inboard, for the duration of the dive.

Additional standard features include: the extra large corrosion resistant air valves, one for each air chamber; a high volume foot pump; a carrying/stowage bag; a repair kit, complete with an entire spare valve insert; and fabric colors—choose between red or two tone blue and black. Among other things, optional accessories might include a wooden fore-deck, a wooden seat, launching wheels,

bow stowage bins, a fishing pole holder and a pressure gauge.

Although the SD-130 has a maximum rating of 35 hp, Achilles recommends an engine size of 20 hp. The SD-130 we evaluated was fitted with an engine of just 15 hp. This boat and engine combination was fine for the light load and smooth water of our trial runs. Performance was quite good, in fact surprisingly so; but I'd suggest a 20 hp engine for operations with bigger loads or heavier seas. With more weight closer to the bow and a little larger engine, planing would have been even easier than we encountered.

Overall, the Achilles SD-130 should be an ideal inflatable for a very wide variety of aquatic activities—and especially well suited to short trips with four to six divers. This boat is stable and safe and exhibits very good performance. Its smaller size and lighter weight are advantageous in storing, transporting, assembling and launching. And, its larger loading capacity is a benefit when the passengers all want to take extra tanks. This "biggest of the small boats" appears to have combined the best features of both the smaller and larger inflatables. All of this plus a five year warranty on the fabric and seams, backed by the Achilles reputation, is available for a suggested retail price of \$2,830—a mere pittance for a boat that can provide you with nearly a ton of fun. 

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Available in a wide variety of colors as shown here, and sizes, small, medium, large.

3320: Zip front drive skin. Price \$39⁹⁵

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- **Children's Dive Skins:** available in front zip model in sizes, medium and large. Color is black with yellow stripe as shown.

3322: Children's dive skin: Price \$36⁹⁵

- **Lycra Dive Hood:** provides warmth and protection from jelly fish among other things. Also making it easier to put on and remove your mask. One size fits all. Available in black or royal blue.

3325: Lycra Dive Hood: ~~\$14⁹⁵~~ \$9⁹⁵ introduc. price

- **Lycra Dive Gloves:** provide warmth and protection from coral cuts and jelly fish stings. Now you can do away with thick bulky gloves and enjoy total freedom of movement of the hands. Available in black or royal blue. Sizes: small, and large.

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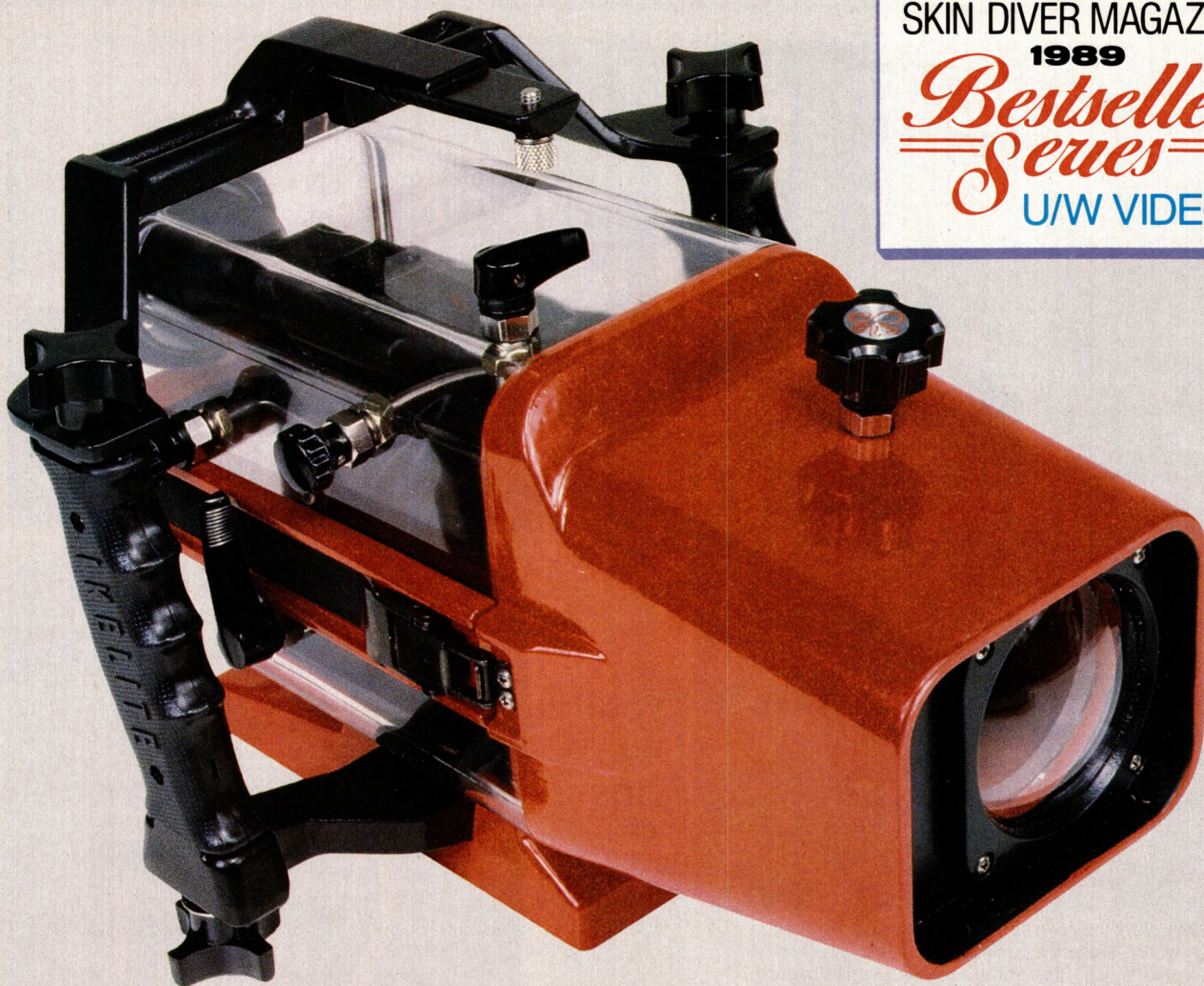
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Over the past 25 years, the changes in photography have been overwhelming, but Ikelite Underwater Systems has been keeping pace, making underwater housings to accommodate each change. Armed with an idea of housing Kodak's Instamatic, Ikelite ventured into creating underwater camera housings in 1964. Then there was no stopping. Eventually, lightmeters, electronic flashes, lights, SLR cameras and even Polaroid cameras were housed by Ikelite. Then, in 1984, the company took another plunge by producing a new line of housings for video camera systems.

One such housing for the Sony CCD-V9 camera (Model #6033.9) is a unique hybrid housing, half clear polycarbonate, half aluminum. Also unique is the method for attaching the two halves. A metal band surrounds the polycarbonate part of the housing and is compressed against the metal half using catch and carry clips. A metal bar with two plastic handles is attached to the polycarbonate half, allowing a variety of accessories to be attached to the camera housing. A special optical dome port corrects for refraction and color saturation, while maintaining the same angle of coverage above and below water.

Ikelite Video Housing for the Sony CCD-V9

DIVING'S FIRST HYBRID VIDEO CASE

TEXT AND PHOTOGRAPHY BY
JACK AND SUE DRAFAHL

THE CONTROLS

The Sony CCD-V9 camera housing has six control knobs, which use both O-rings and internal X-rings.

The first control—on the top, polycarbonate part of the housing—provides power to the camera. Just pushing down on the control and pulling it up will turn the camera on. Two controls near the right handle allow the videographer go from standby to record or to lock or unlock the record button in order to prevent accidental use. A fourth control above the right handle gently rocks back and forth

allowing a smooth zooming of the camera lens.

The white balance on the Sony CCD-V9 is operated by a fifth control on the lower right side of the housing. The only control on the metal part of the housing is used for manual focusing.

After talking with the manufacturer, we found that a seventh control is planned, one that will allow access to the forward and reverse controls on the top of the camera. This will allow the videographer to rewind or view the tape or record the scene over. This could be a very handy

feature. A good example would be if you had taken 10 minutes of not so exciting reefs and then found yourself face to face with a whale shark. Simply rewind the tape and re-record.

CAMERA INSTALLATION

To load the camera in the housing simply unfasten the two catch and carry clips and remove the polycarbonate back. Next attach the CCD-V9 camera to a special Delrin baseplate using a 1/4-20 bolt, supplied with the housing. Pull out all the controls on both halves of the housing. Re-join the two housing halves, align the controls and you are ready to go.

The clear polycarbonate half of the housing not only ensures that you can see to align all the controls, but also allows the videographer to monitor for any human error, in the form of water leaks, so major disasters can be prevented.

In order to see a full image through the back of the housing Ikelite has developed the Video Eye, a replacement eyepiece for most video cameras including that of the Sony CCD-V9 camera. The original eyepiece is removed from its bayonet mount and replaced with this larger eyepiece, which provides an image that is four times larger. The Video Eye makes focusing and viewing easier for those wearing a facemask.

There is a special handle attached to the top of the housing so it may be picked up from the top instead of the sides. This

handle has a small extension with a bolt for attaching a Nikonos V, allowing both still and video to be used on one dive.

CAMERA ACCESSORIES

If wide angle images are desired, a special wide angle adapter (#6430) can be attached to the camera lens to double its angle of coverage. Color correction filters can be added between the wide angle adapter and the lens.

HOUSING ACCESSORIES

If the videographer wants to dampen pitching motion while swimming through the water, V-Wings can also be attached at the same point the top handle was attached. These V-Wings can be folded in to a storage position while topside and unfolded underwater. The top handle and the V-Wing can be mounted together or separately, depending on the needs of the user.

IKELITE PRO VIDEO-LITE

An additional lighting system can be

OPTIONAL ADD-ONS

Housing

V-Wings.....\$69.95

Pro Video-Lite

(lead acid battery).....\$695.00

(nickel-cadmium battery).....\$895.00

Camera

Wide Angle Adapter (#6430)....\$119.95

Color filters.....\$50.00 each

added to the housing by removing two large bolts from the base, which allows the quick connect or disconnect of the Ikelite Pro Video-Lite system. The battery pack inside the base unit uses either lead acid or nickel-cadmium battery packs. Each side of the unit has its own power control and electrical connection to operate a single 100 watt Lite Head. Each Lite Head features ultra-wide 100 degree coverage and a built-in 20 watt modeling light, which is most helpful during night dives. One Lite Head with a nickel-cadmium battery pack can last 70 minutes, while a system using two Pro-Lites with 200 watts will last about 40 minutes.

CONCLUSION

The Ikelite housing for the Sony CCD-V9 is extremely well built, easy to use and, most importantly, offers the videographer versatility. Each videographer can add just the right accessories and adapters to fit his/her specific needs.

When the housing and camera were assembled, we found the controls to be light to the touch and gentle to the Sony camera. We also liked being able to see everything that is going on through the Lexan part of the housing. Jack and Sue give it two thumbs up. Score another winner for Ikelite.

For more information and/or an Ikelite catalogue write the company at 50 West 33rd, P.O. Box 88100, Indianapolis, IN 46208. >

COMPARISON OF IKELITE VIDEO HOUSINGS FOR *SONY CAMERAS

Housing Model	Cameras Accepted	Suggested Retail	Housing Material	Controls Provided	Weight w/Camera	Wide Angle Lens	Optional Color Filter	Format	Minimum Illumination	Auto-focus	Maximum Record Time
# 6034.11	CCD-V11 Ricoh R-630	\$695	Clear polycarbonate/ aluminum	Power Start/stop Power zoom Focus	21 lbs.	Optional # 6430	# 6440.46	8mm	5 lux	Above water	120 min.
# 6304.4	CCD-F40 Ricoh R-620	\$795	Clear polycarbonate/ aluminum	Power Start/stop Power zoom Focus Title 2/color	21 lbs.	(Included) .5x lens	# 6440.46	8mm	4 lux	Above water	120 min.
# 6034.3	CCD-F30	\$795	Clear polycarbonate/ aluminum	Power Start/stop Power zoom Focus Sup. impose	21 lbs.	(Included) .5x lens	# 6440.46	8mm	9 lux	Above water	120 min.
# 6033.9	CCD-V9 Ricoh R-600	\$695	Clear polycarbonate/ aluminum	Power Start/stop Power zoom Focus White balance	22 lbs.	Optional # 6430	# 6440.46	8mm	5 lux	Above water	120 min.
# 6033.5	CCD-V5	\$695	Cylindrical PVC	Power Start/stop Power zoom Focus Filter/wh. bal.	23 lbs.	Optional # 6430	# 6440.46	8mm	9 lux	Above water	120 min.
# 6033	CCD-V3	\$695	Cylindrical PVC	Power Start/stop Power zoom Focus Filter/wh. bal.	23 lbs.	Optional # 6430	# 6440.46	8mm	16 lux	Above water	120 min.
# 6029	CCD-M7	\$595	Clear polycarbonate/ aluminum	Start/stop	15 lbs.	(Included) .5x lens	# 6440.29	8mm	9 lux	No	120 min.
# 6030.3	CCD-M8	\$595	Clear polycarbonate/ aluminum	Start/stop Filter	18 lbs.	(Included) .42x lens	# 6440.30	8mm	25 lux	No	120 min.

*Ikelite also offers a full line of housings for other video cameras, including JVC. Write for a catalogue.

Though more than one million people visit Crater Lake each year, less than 10 permits are issued annually to dive in this, the deepest lake in the United States. That qualifies that 1,932 foot deep marvel of nature as a virgin dive site in anyone's logbook.

Crater Lake is at the center of Crater Lake National Park in south central Oregon. The 183,000 acre park was established in 1902 to preserve what many people believe is the most beautiful lake in the world. Crater Lake is often referred to as the "eighth wonder of the world." The founders of the park could not have known the lake's beauty extends below the sparkling blue surface.

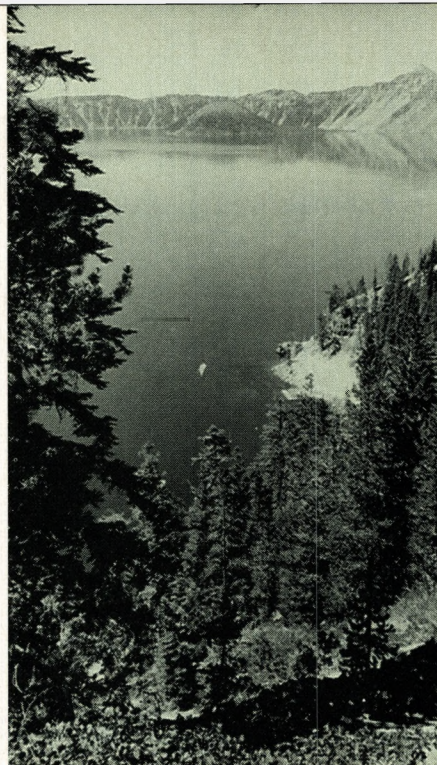
A few patches of snow still lingered in the shade of giant hemlock and fir trees as we traveled up into the mountains. The entourage included my dive buddies Ralph and Hojo and our willing, if not completely enthusiastic "sherpas," Denise, Pat and Dave. Our destination was Cleetwood Cove.

The reason for our bearers' lack of enthusiasm may have had something to do with the hike ahead. The Cleetwood Trail, though only a little more than a mile long, is the steepest trail in the park. Beginning at an elevation of 6,850 feet, the trail drops nearly 700 feet before reaching the lake level. The thin air at this altitude made the hike all the more fun. Each diver had in excess of 100 pounds of gear to get down and, more importantly, back up the trail at the end of the day.

When the task is tough, count on a diver to come up with some good old fashioned American ingenuity. The answer to surviving the hike without a broken back was to put most of the gear on wheels. We all had a different concept of the best way to meet the challenge. I adapted my two wheeled golf cart to hold my tank and loaded the rest of my gear into three backpacks—one for me, one for my wife Denise and the weightbelt, with 21 pounds of weight, for Dave. Ralph utilized a welding tank cart for his scuba tank and weightbelt and Pat carried the rest of his gear. Hojo borrowed his daughter's little red wagon and piled it high. Dave carried his 20 pound weightbelt, too.

Although temperatures were in the low 80s(°F), the hike down was not as tough as anticipated. Tantalizing views of the lake were plentiful and the bottom grew closer after each turn in the trail. Viewing the water filled crater left by the eruption of Mt. Mazama about 6,800 years ago seemed to help us keep cool.

Before the eruption, Mt. Mazama is believed to have stood 12,000 feet high. The eruption, estimated to be 40 times greater in power than that of Mt. St. Helens, caused the mountain to collapse. Over the next few thousand years Crater Lake filled. With an average snowfall of 45 feet per year, it may not have taken that long—especially if there were a few more winters like the one of 1932/33,



photo/Michael D. Underwood

CRATER LAKE

Diving The Deepest Lake In The U.S.

BY MICHAEL D. UNDERWOOD

when the heaviest snowfall on record, 73 feet, was recorded.

After reaching the bottom we unloaded our gear and started suiting up. Ralph and I were wearing drysuits. Hojo mumbled something about only wimps stay dry as he squeezed into his wetsuit.

As we entered the water, its clarity was the first thing that struck me. The visibility was an easy 100 feet, by far the best I'd ever experienced on any dive in Oregon waters. Less than 50 feet from shore, we were already at 30 feet. We knew how deep the lake was but we weren't prepared for our next encounter. A vertical wall, which seemed to extend forever, loomed in front of us. We went down to 60 feet, hanging close to the rock. Below us we could see at least another 80 feet before the blue became so vivid our sight could not penetrate deeper. (Later, back on shore, we discovered from the local sightseeing tour boat operator that sonar readings displayed the bottom of the wall at more than 800 feet.) Though not covered in corals and sponges like Grand

Cayman's walls, the grandeur of this wall sent a feeling of exhilaration through me.

The lake was stocked with fish for the first time in 1888. However, we saw only a few trout gliding along the barren rocks. There were no French grunts or glassy-eyed snappers such as those found in the warmer waters of the Caribbean. Here, in the 48°F water, the attractions are the massive volcanic rock formations born of an ancient violent eruption.


Being one of the few who have had the pleasure of diving here, I took the opportunity to name an interesting spot on the wall: **Lure Ledge**. At about 60 feet a protruding ledge had captured dozens of hooks and lures of fishermen. The tangled lines, draped in fine sediment, resembled the web of a deranged spider.

Ralph found a small cave. We watched our bubbles splash on the roof, roll along toward the opening, then bend up and rush to the surface. A glance at our watches told us it was time to do the same. We were diving high altitude tables, using 8,000 feet as our elevation. We would be as high as 7,500 feet on our trip out of the park. At that elevation we were allowed 35 minutes of bottom time at 60 feet.

We exited the water at the tour boat dock. Almost before our regulators were removed, conversation was rapid. Our excitement was obvious as we recapped the events of the dive. After allowing our gear about one-half hour to dry, we loaded up for the trek out.

This is where our sherpas proved their value. Our carts, which had worked so well coming downhill, were like dragging huge rocks going uphill. Our arms felt as if they would stretch from the strain. The muscles in our legs grew tighter with every shortened stride. Our lungs begged for the oxygen available at sea level. As I neared the top I was stopped by an older couple. The lady asked in astonishment if I had used all my oxygen in the tank for the trip up. She pleaded with her husband—that they couldn't possibly make it if a young man like myself needed oxygen for the climb. I explained that the tank was used for scuba diving in the water and was only filled with compressed air. I think she understood.

We all made it out, and before our heart rates returned to normal we were well into sandwiches, tortilla chips and a variety of thirst quenchers. Talk was of the great dive and having T-shirts made to commemorate the occasion. How does "Crater Lake Thin Air Dive Club" sound? Too long?

A permit (free) is required from the Park Service to dive Crater Lake. Along with the permit the ranger provides useful tips on where to dive and a few safety precautions are discussed. For more information call (503) 594-2211 or write Superintendent, Crater Lake National Park, P.O. Box 7, Crater Lake, Oregon 97604. 

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TEXT AND PHOTOGRAPHY BY
BONNIE J. CARDONE

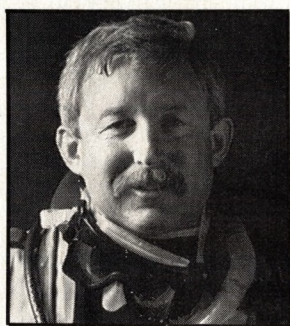


My first pair of ski goggles had rose colored lenses. They worked great as long as the skies were sunny and clear and, for a couple of days, I skied in rose colored bliss. Then the weather turned bad. Skiing in a near whiteout I

found my pretty red goggles next to useless. They kept the snow out of my eyes but did nothing to increase visibility in my winter wonderland. Ridges and bumps in the ski trails were indistinguishable from flat snow. As a result, skiing was hazard-

ous and I didn't have a lot of fun. That's when someone recommended yellow lenses. The difference they made was amazing. Now I could see problems before it was too late to avoid them. The yellow lenses increased visibility by adding

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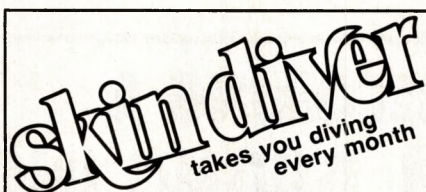
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CLEAROPTICS

contrast and improving depth perception.

The yellow goggles worked when the red ones didn't because yellow holds back blue and lets its own color through. Thus, when the scene is a monochromatic blue, yellow will increase contrast and add depth. That's why skiers wear yellow tinted goggles in fog, snow storms, overcast conditions and late afternoon. That's also why car fog lamps are yellow; photographers use yellow filters when shooting black and white pictures; and hunters wear yellow tinted glasses in dim light.

Knowing how yellow lenses aid participants in other activities, optician John Todd figured they would help divers, too. Todd started diving in 1970. After two years of viewing an underwater world that was a boring blue, he decided divers needed a a facemask lens that would allow them to see colors without using lights. He found a special yellow tint that is in the middle of the color range the human eye can perceive. Very soon he was bonding lenses tinted this special yellow to facemasks. Thus was born ClearOptics Laboratories. The company specializes in bonding yellow lenses to divers' masks. These lenses can also be custom ground to the wearer's prescription.

According to Todd, his yellow lenses capture and amplify available light, increasing color impulse absorption and allowing the wearer to retain up to 80 percent of his/her normal color perception underwater. They also increase visibility and add contrast. Todd says his lenses allow divers to see color down to 90 feet underwater without using artificial light. Instructors love to wear his lenses for pool work with students, he told me, because the lenses cut down on glare.

I first tried the ClearOptics lenses ten years ago. I found they do put colors back into the underwater scene, although these won't be as bright as they would be with a handlight. Also, the deeper you go, the lesser the effect because of the reduced light. The lenses most definitely add contrast and improve depth perception. On my dives with the lenses in 1979 I noted there was a wavy effect when looking up while ascending. This was caused by the adhesive used to bond the lenses to the mask faceplate. ClearOptics uses a different adhesive now and this effect is no longer evident.

You, too, can experience the phenomenon of yellow lenses firsthand. All you need do is send your mask and P.D. (distance between the pupils of your eyes), along with a check or money order for \$89 (plus \$5 for shipping and handling) and your prescription (if you need one) to ClearOptics Laboratories, 4950 FM 1960 W C-3-81, Houston, Texas 77069. Your mask, with its new lenses, will be returned to you in four to six weeks.

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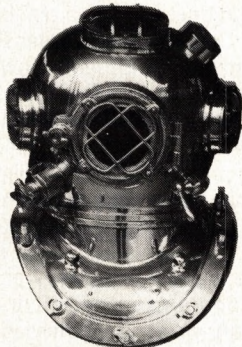
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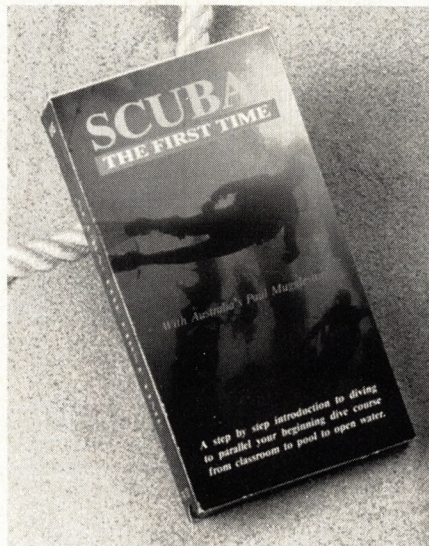
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Besides its educational role, Scuba: The First Time is an entertaining way to share diving with nondivers by revealing just how easy it is to learn to dive. The tape is available at your local PADI Dive Center and Training Facility. (Note: This video is a learning and refresher aid only, and does not replace training from a qualified instructor.)

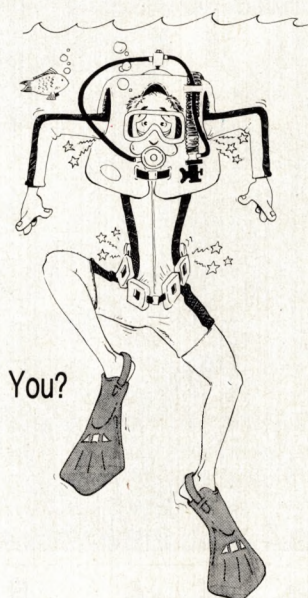
For a free worldwide list of PADI Dive Centers, write PADI, 1251 E. Dyer Road., # 100, Santa Ana, CA 92705-5605.

WOLPA TO TEKNA

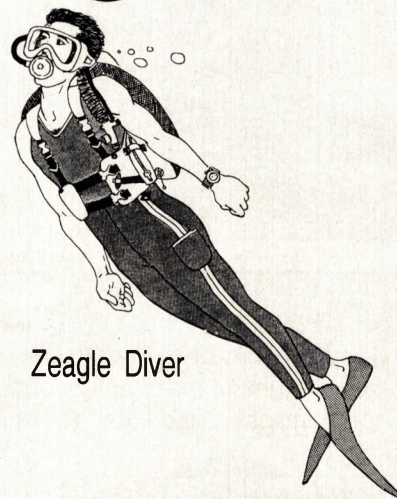
Marvin Wolpa has been appointed Director of sales for Tekna's scuba division. An avid diver, he brings a career of sport diving experience to the Tekna sales team. His experience bridges the consumer, retail and manufacturing areas of the diving industry.

Wolpa served for many years as general manager of a large resort diving operation and retail dive store. As a PADI master instructor and USCG ocean operator, he is well versed in consumer diving services. His experience as manager of a high volume California dive store broadened his knowledge of retail merchandising and dealer support needs. Wolpa's most recent experience has been a key management position with an accessories manufacturer in the sport diving industry.

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If the operator verifies the unit as being involved, it should be returned to the Dacor authorized service location or to Dacor for a no-charge retrofit. *Divers should not use these particular regulators.*

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Princess Beach Hotel & Casino in Willemstad, Curacao has four and seven night dive packages available this summer. These are for double occupancy and offer PADI instruction for all levels of divers. The hotel has its own dive operation on location, managed by experienced PADI dive instructors.

Diving is available in small groups, which guarantees personal attention. Other dive services include night diving, dive safari, photo and video. Exciting shore diving spots are abundant off Curacao and easily found on maps supplied by the dive shop.

All packages include garden view accommodations, American breakfast daily, tax and service charges on rooms and breakfast, certified PADI/NAUI divemaster guides, unlimited airfills for shore diving, Curacao Underwater Park slide presentation and general view of the island, roundtrip airport transfers, complimentary shuttle service to downtown, welcome drink on arrival, casino chips, island wide discount booklet, complimentary use of tennis court and complimentary towels and chaise lounges at beach and pool.

Single, triple and quad rates are available, as well as special packages for the accompanying nondiver. Upgrades to ocean view accommodations are available at an additional cost. Group rates both for divers and nondivers are also available. Other hotel services include a Mistral windsurfing school, pool, shopping arcade, tour and car rental desk.

For additional information contact Travel Marketing Concepts Ltd., 16 Ketchum Street, Westport, CT 06880; (203) 454-3330. For reservations contact ITR Dive Desk, Four Park Avenue, New York, NY 10016; (800) 451-9376 nationwide—book through your favorite Caribbean wholesaler.

SKIN DIVER MAGAZINE

TRAVEL



Left: Silky sharks (*Carcharhinus fal-ciformis*) at the Deer Island Buoy. Above: The Nassau Undersea Adventures store. Below: The dive center is on the inland waterway.

STUART COVE'S NASSAU UNDERSEA ADVENTURES

TEXT AND PHOTOGRAPHY BY GREG JOHNSTON

Few dive destinations are as predictable as Nassau, on New Providence Island in the Bahamas. True, Nassau has all the right elements—deep walls, spectacular corals, schools of fish and wrecks—but when the extraordinary becomes the ordinary, that's what I call predictability.

For example, when the anchor is dropped at a site called **Runway**, you may be cautioned about low flying aircraft. Don't bother to look up, these "aircraft" are found along the underwater runway in the form of saucer-shaped stingrays with wing spans of more than six feet. Perhaps you have always wanted to see a large shark and the thought of jumping into a school of several dozen sharks rivets the outer edges of your wildest imagi-

nation. It was for the experience of diving with sharks that I had come to Stuart Cove's Nassau Undersea Adventures. His operation is at the beautiful Lyford Cay Resort on the west end of New Providence.

Years ago I had heard about the dozens of sharks that would gather beneath the U.S. Navy buoy tethered in 6,000 feet of water off Chub Cay. A few years ago, when the buoy was moved to a new location 12 miles off the southwest tip of New Providence, Stuart Cove began running specialized trips for advanced divers to what is now called the **Deer Island Buoy**.

For most, watching a television special on sharks is the closest they ever come to seeing these magnificent creatures underwater. But, even a

large TV screen cannot prepare you for the excitement of a shark dive. The opportunity to photograph predictable sharks at close range is a thrill of a lifetime. I admit, the thought of stepping off the dive platform into 6,000 feet of water swarming with sharks is a bit unnerving, however, the real danger here is maintaining proper buoyancy in the vast blue. It is easy to sink into deep water when the only visual reference is a steel cable anchoring the buoy to the ocean floor and the boat overhead, tied off to the buoy.

I have dived the buoy only on occasion. And, while the sharks do get close, I have never actually felt threatened by them. However, several times



TRAVEL

the sharks have bumped me, assuring an exhilarating charge of adrenaline. The sharks' attraction to the buoy seems to be the ample supply of food in the form of schooling jacks and rainbow runners. Squid or ballyhoo have proved an excellent enticement to bring the sharks up close. Most of the animals are small silky sharks, three to five feet long. On a rare occasion a six footer will cruise by, but the smaller sharks are always in attendance, although their number varies.

Drivers should be aware, however, that this is an isolated dive far from the beautiful reefs found along the west and south shores of the island. In fact, New Providence diving is some of the very best I have experienced in the Bahamas. And, the attractions Nassau offers to a nondiving partner, such as nightlife, the casinos, Coral World, etc., are outstanding.

Almost since the beginning of filmmaking, the waters off Nassau have been "the worldwide center of subsea motion picture production." Many companies, including Disney, have used Nassau reefs for filming. The first movie made here was the legendary 1920s silent version of *20,000 Leagues Under the Sea*. During the 1960s and '70s several James Bond underwater scenes were filmed off Nassau, and recently many other films, including *Splash*, *Wet Gold*, *Cocoon* and *Jaws: The Revenge*, have been shot on location with the help of Nassau Undersea Adventures.

Nassau Undersea Adventures is owned and operated by Stuart Cove. Born and raised in Nassau and educated in Canada, Cove is a man who is enamored with the sea. He started Coral Harbour Divers more than nine years ago; for the past six years his dive facility has been at its present site. Cove's hard work, perseverance and patience have made Nassau Undersea Adventures one of the most successful and respected dive operations in the Bahamas.

Today, Nassau Undersea Adventures is headquartered in a handsome pink and white stucco building on an inland waterway. The building contains the retail sales center, a complete line of rental scuba gear and a repair center. There is also a lounging area, restrooms and racks of movie theme T-shirts for sale. Several old ar-

Right: The Orange Hill Inn has 21 units, most with an incredible ocean view. Some have cooking facilities, all have cable TV. Below right: Stuart Cove has made Nassau Undersea Adventures one of the most successful and respected dive operations in the Bahamas. Below left: The Nassau Undersea Adventures staff.



tifacts, including the 50mm gun from a World War II bomber are displayed.

A freshwater pool adjacent to the dive center is used to teach resort courses. There are ten full time employees including six PADI certified instructors who teach full scuba certification and specialty courses and specialize in student referrals.

Some of Cove's recent scuba students include such celebrities as Brooke Shields, Kim Basinger, Priscilla Presley, Tom Hanks and Ron Howard. Others include local residents such as Sean Connery. You might just get lucky and have Robert Redford drop by for a quick morning dive. Pictures of Cove and the diving celebs form a decorative collage on the walls of the dive center. However, when Stuart Cove is not working on movie sets or teaching advanced diving skills to movie stars, he's out on the boat showing his guests the very best of "Nassau" diving.

Special custom videos by photo pro and operations manager, Frazier Nivens are available of your shark encounter or any other dive experience. Expertly filmed, professionally edited and with soundtracks, the videos are a big hit among guests. There are also Nikonos V underwater camera rentals and E-6 processing available.

Nassau Undersea Adventures maintains an impressive fleet of dive boats. The main boat is the *Black Coral*, a 44 foot, twin diesel, custom craft with a flat deck and high tower. The newest addition is the 40 foot, twin

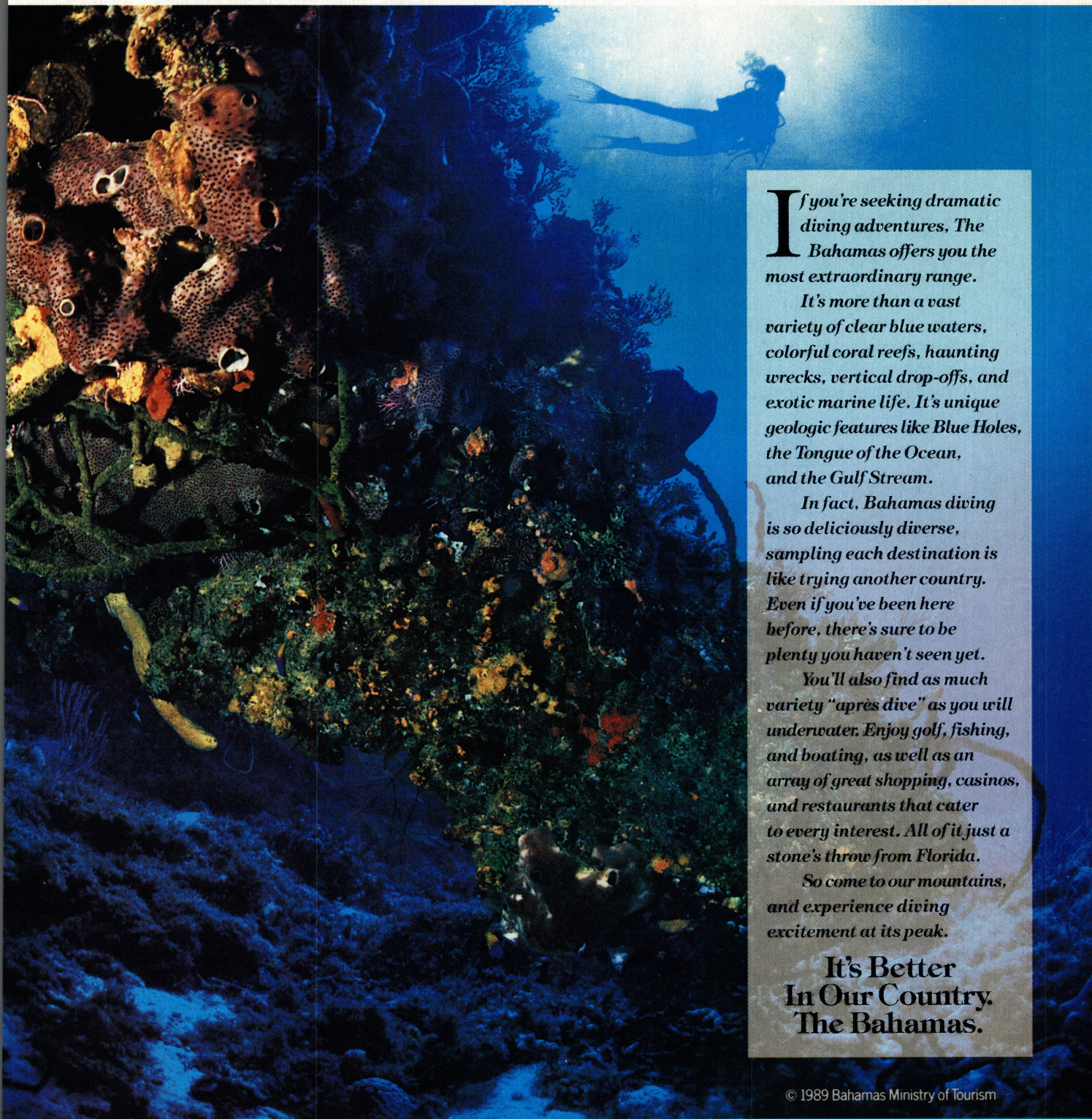
diesel, custom designed dive boat, *Adventurer*. Secondary boats are a 30 foot single diesel open fisherman called the *Alien Orders*, a 25 foot twin outboard Mako and a 17 foot single outboard Whaler used for resort course shuttles. All of the boats are well equipped for divers and their gear. Additionally, a satellite dive center on beautiful Lyford Cay beach specializes in resort courses and rents windsurfers and Sunfish sailboats.

Nassau is the capital and largest city of the Bahamas and well known for its classy hotels, historical forts, straw markets and cruise ships. And, of course, there are the glittery casinos of Paradise Island and Cable Beach. Nassau Undersea Adventures operates a unique shuttle that services all the hotels on the island. All you have to do is call the shop the day before to reserve your space on the boat, the bus will be by to pick you up in the morning. Shuttles run daily.

If you are booking dive packages, you will be staying at my favorite hotel on the island, Orange Hill Inn. The lovely family style inn, owned and operated by Danny and Judy Lowe, is perched upon a scenic bluff overlooking a palm lined sandy beach and emerald waters.

Orange Hill has 21 units, most with an incredible ocean view. There is a full range of units suitable for singles, couples, families and large groups. Some have cooking facilities, all have cable television. The mainhouse serves as a gathering place and cool

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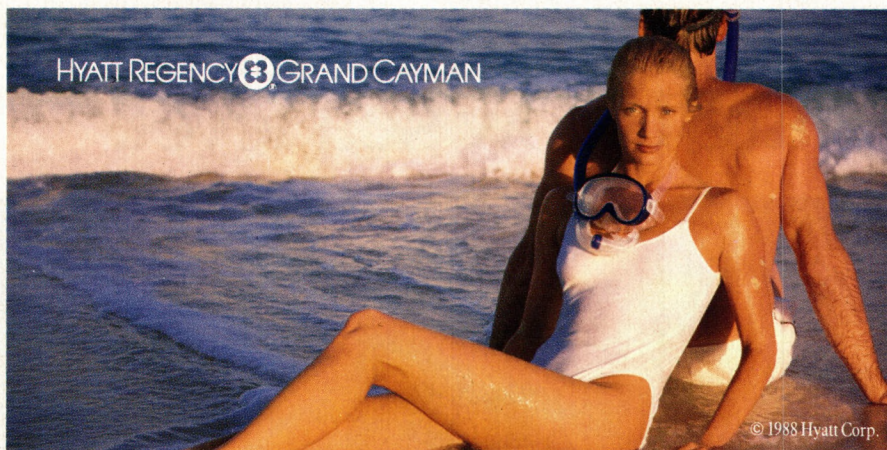
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NASSAU UNDERSEA ADVENTURES

island drinks are served at the bar. Once a former orange plantation, the inn is an attractive combination of old and new architecture, tropical fruit trees, friendly and personal service.

Less than ten minutes from Orange Hill Inn is the dive center and less than 20 minutes from the dive center are the fabulous reefs and wrecks of west New Providence Island.

At the Runway the 30 to 40 foot depths lead to a sandy bottom with an isolated coral cluster. Within this small cluster is a very active cleaning station. Here, the southern stingrays that populate the sand expanses of the Runway will frequently circle the corals to be cleaned.

Clifton Wall begins in just 30 feet of water and plunges vertically to 6,000 feet. The wall forms a continuous barrier around the southwestern tip of the island. Like many of the walls here, this one has huge pink and white tube sponges adorning its jagged face. Black coral is found in lush forests and huge elephant ear sponges provide colorful accents.

Sand Chute Wall and **Tunnel Wall** are other favorites. Sand Chute is most notable for the 40 foot trawler sunk precariously on the edge of the wall in 60 feet of water. From the bow section, one can peer over the wall into the infinite depths of the Tongue of the Ocean. Tunnel Wall is famous for its intricate network of honeycomb crevices and tunnels leading from the shallow reef to the drop-off. The top of the wall is encrusted with heavy concentrations of brain corals and colorful gorgonians. It features large groupers and schools of patrolling jacks.

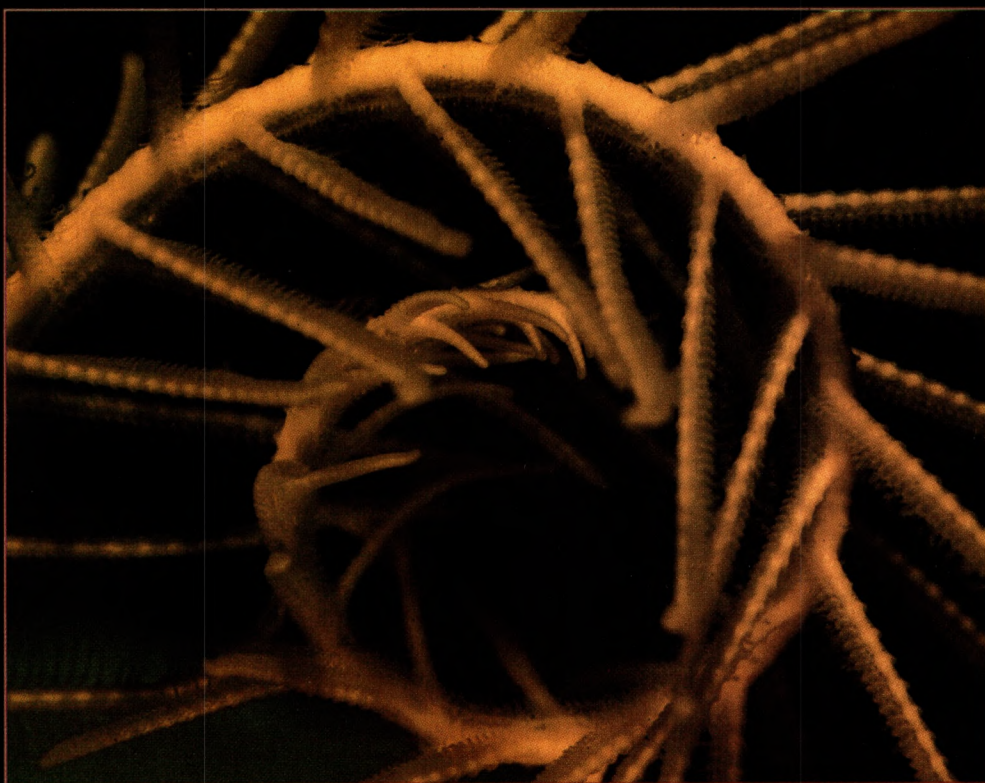
Goulding Cay has some of the prettiest concentrations of elkhorn coral found in the Bahamas. This site is excellent for snorkeling or as a second dive. Probably the most frequently dived sites are the Bond wrecks. One is the 100 foot freighter known as the **Tears of Allah**, sunk intentionally for the James Bond thriller, *Never Say Never Again*. Then there is the encrusted ribbing of the **Vulcan Bomber** featured in *Thunderball*. Other exciting dives include the **Cocoon Movie Set**, the **Lyford Cay Wall**, the wreck of the **Wil Laurie** and the **Cessna 309**, crashed for *Jaws 4*.

A new dive operation is now open for divers who prefer to live on their own island. Nassau Undersea Adventures offers a week's stay on Spirit Cay—an Exuma out-island.

Spirit Cay, just south of Highbourne Cay, is the perfect place to just get away and relax. This beautiful private retreat has a house equipped with a chef and boat captain and is designed to entertain groups of 8 to 10 for a week of diving.

(Continued on Page 75)

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Peter Hughes Diving

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Jump aboard **Sea Dancer** with your own custom-designed Peter Hughes dive gear bag! When you arrive on any one-week package between April 29 and October 28, 1989, we will give you absolutely FREE this handsome, sturdy gear bag manufactured by Sherwood and custom designed by Peter Hughes. It's perfect for your **Sea Dancer** adventure!



Sea Dancer

Sea Dancer, Peter Hughes' majestic liveaboard flagship is now cruising the fabulous Windward Islands. Visit exotic dive sites surrounding beautiful St. Kitts, marvelous St. Maarten, historic St. Eustatius and the fabled isle of Saba. The underwater scenery is a mesmerizing display of schooling fish, volcanic peaks and pinnacles, seamounts and ancient shipwrecks. It's positively spellbinding.

Call us today for our schedule and availability.



Discover

in the Caribbean.

Wilderness Diving with Peter Hughes Hospitality



Divi Tiara and Dive Tiara

Divi Tiara Beach Resort with expanded Dive Tiara and Photo Tiara offers the best of both worlds! The unparalleled diving adventure of Cayman Brac and the hassle-free **Peter Hughes Diving**. Located on the secluded island of Cayman Brac, the intimate **Divi Tiara Beach Resort** offers excellent services in an undisturbed island paradise. Mystical reefs and legendary walls harboring scores of friendly grouper provide an experience close to supernatural.



the Difference!

Divi Bahamas and Dive South Ocean



It's no illusion! We've duplicated the famous **Peter Hughes Diving** program in the alluring blue-green kingdom of the Bahamas. The new **Divi Bahamas Beach Resort & Country Club** is secluded on the western end of New Providence Island, only a short distance from the excitement of Nassau. Divi Bahamas is a sports enthusiast's paradise featuring sparkling pools, tennis, golf and complete watersports facilities with windsurfing instruction. **Dive South Ocean** and **Photo South Ocean** offer services and equipment in keeping with the tradition of **Peter Hughes Diving**. New Providence holds within its crystal waters superb shallow reefs, exquisite marine life, movie location shipwrecks and dramatic drop-offs leading to the mile-deep 'tongue of the ocean.'

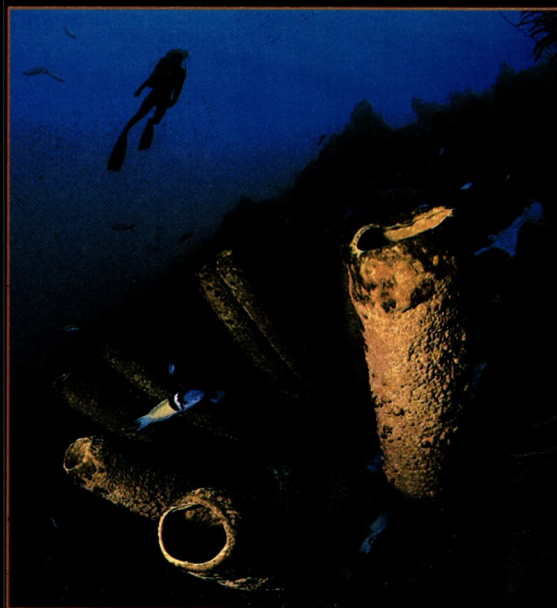


Call today for your complete Peter Hughes Dive Directory and information on air-inclusive packages. Ask about our new Peter Hughes Dive St. Croix.

800-333-3484

Divi Flamingo and Dive Bonaire

Experience the charm of the perfect dive resort on the perfect diving island. Here the **Peter Hughes** legend began and it's never been better. **Divi Flamingo Beach Resort & Casino** and **Dive Bonaire** provide unequalled amenities and services. The best selection of boats, equipment and personnel in the dive travel industry are available for your comfort and enjoyment. Bonaire's tranquil sea, golden reefs and dazzling marine life will cast a spell over you and provide diving thrills of a lifetime.



Peter Hughes
DIVING  DIVI RESORTS

"Peter Hughes Diving has earned its reputation as the premier dive operator in the Caribbean. We continue with an unwavering commitment to excellence and professionalism for the travelling sport diver!"

Peter Hughes

DIVI HOTELS MARKETING, INC. 54 Gunderman Rd., Ithaca, N.Y. 14850, 607-277-3484
ANTIGUA • ARUBA • BAHAMAS • BARBADOS • BONAIRE • CAYMAN BRAC • SABA • ST. CROIX • ST. EUSTATIUS • ST. KITTS • ST. MAARTEN • TURKS AND CAICOS.

NASSAU UNDERSEA ADVENTURES

(Continued from Page 74)

deepsea fishing, snorkeling, windsurfing and much more.

The Exuma Cays are special places. Wall diving is only minutes from the beach and there are miles of virgin reefs to explore. The safaris include trips to Allen Cay to see large iguanas and to Camp Driftwood on Shroud Cay for luncheons. At night there is a large library in the house and entertainment is island style—just relaxing. Spirit Cay is accessible only by flying to nearby Norman's Cay and taking a short water taxi ride.

For more information on New Providence or Exuma diving, contact Stuart Cove, Nassau Undersea Adventures, P.O. Box CB 11697, Nassau, Bahamas; (809) 326-4171. Or contact Nassau Undersea Adventures through the U.S. office at Aero International Tours, P.O. Box 328, Ft. Lauderdale, FL 33302-0328. You can call (800) 468-9876 or (305) 359-3066 in Ft. Lauderdale. ✽

THAILAND DIVING

Phuket Island, which is connected by causeway to the southernmost tip of Thailand, plays host to avid divers of all nationalities. Unique underwater landscaping and an abundance of fish species characterize the dive sites of this locale. Daily guided boat trips are offered by Andaman Sea Diving and Watersports at the Phuket Cabana Resort, on Chalong Bay and in the Cape Panwa Sheraton. This efficient, professionally run enterprise has the largest fleet of diving vessels in Phuket and an experienced North American/European instructor staff.

This December saw the opening of Andaman Sea Diving's stationary live-aboard pontoon in the Similan Islands. An all-inclusive casual retreat for those who are serious about their diving, it is in a sheltered bay, 400 feet from a white sandy beach. Since it floats above the coral heads, it is possible for guests to dive from their bedrooms to the reef below at any time of the day or night.

Water temperatures are constant at about 78°F and underwater visibility is usually 40-100 feet. Thailand is warm and sunny 10 months out of the year. Rougher seas and occasional rain showers are primarily experienced during August and September. During the extremely favorable weather conditions, from December to April, the Similan Islands Pontoon is operational. Conveniently, this coincides with North America's winter.

For more information on this exotic dive destination contact Andaman Sea Diving at (800) 661-9143, in Canada at (403) 253-1163. ✽



At Cayman's number one dive hotel, that's just how you'll feel.



In the last 30 years we've built a reputation as Grand Cayman's premiere Dive Hotel.

Yet this doesn't mean we've grown bigger than our booties.

Unlike the larger hotels we get a chance to know you by name, not room number.

The personal care and attention you'll get as a Sunset Diver makes all the difference.

Whether you're a novice or pro-diver we'll treat you like someone

special. After all we're divers ourselves and we know what it takes to make a great dive vacation greater.

Call us now on 1-800 854 4767 or 1-809 949 7111 or write PO Box 479, Grand Cayman, BWI to find out more.



Grand Cayman's Hotel For Divers By Divers.



New at Sunset House The World Famous Cathy Church School of Underwater Photography

"I'll help you the way I'd like to be helped when I take my own pictures underwater"

Cathy Church

For more information about my special week-long, multi-level courses May - Sept., call me at 809-949-7111, or write directly P.O. Box 479, Grand Cayman, B.W.I.

DIVI *Flamingo* BEACH RESORT



NOME OF PETER HUGHES' WORLD RENOWNED DIVE BONAIRE

TEXT AND PHOTOGRAPHY BY STEPHEN FRINK



Top: The high quality of the Divi Flamingo Beach Resort and Casino is evident at first glance. **Above:** Suzie Swygert and a French angel at Twixt. **Above right:** Dive Bonaire boats.



By process of evolution, design and hard work, the Divi Flamingo Beach Resort and Casino has grown to represent one of the dive industry's most complete and popular destinations. Looking at today's modern 10 acre, lavishly landscaped complex, it would be hard to envision the humble beginnings of this dive mecca. Today it has 145 double rooms and suites, two freshwater swimming pools with whirlpool, two restaurants, two bars, casino and complete services for the scuba diver and U/W photographer.

Imagine the late 1940s: Scuba diving as a recreational activity was still decades into the future and Bonaire was a wild, primitive, arid isle best known for its evaporative salt industry. Tourism was not yet viable and one of the island's premier pieces of real estate, right on the Caribbean and overlooking an immense coral reef beginning just 20 yards offshore, was being used as a prison camp to incarcerate German POWs during World War II. Today people gladly pay to enjoy spending a week on these same

grounds, but during World War II austere bungalows were under guard by the Dutch military and residence was hardly a privilege.

In 1952 the property was renovated and opened as the Hotel Zeedad. KLM clippers flew tourists in from Curacao and South American and European travelers began to appreciate the beauties of Bonaire. Sun, sailing and fishing were the prime attractions and the Hotel Zeedad was modestly successful. It was finally sold to a Dutch family in 1958 and renamed the Flamingo Beach Club.

The modern era for the Divi Flamingo Beach Resort and Casino began in the late 1960s when Joyce and Wally Wiggins of the Divi Hotel Corporation visited Bonaire for the first time. Divi already operated a resort property on nearby Aruba and immediately sensed the potential of Bonaire as an attraction to watersports enthusiasts, especially for the emerging sport of scuba diving.

In 1975 the Flamingo Beach Club was purchased by Divi Hotels, renamed the Flamingo Beach Hotel and significantly upgraded. There were 50 rooms in service at the time. Divi converted the old saltwater swimming pool to fresh water and the Chibi Chibi restaurant was constructed on a unique cantilevered platform overlooking the sea. Given the incredible quality of the scuba diving on Bonaire (which people were just beginning to realize) and the growing popularity of the sport, the search began almost

immediately for a dive operation. Enter Peter Hughes.

Peter arrived on Bonaire with his wife, Alice, as the operations manager for Teach Tour, a now defunct enterprise that tried to establish diving services on several Caribbean islands in the early 1970s. Operations manager is perhaps too lofty a title for Peter's job at the time. The dive shop shared quarters with the maids in the laundry room and Peter would pump a few tanks on a tediously slow compressor, shlep the tanks down to the Calabas pier in a dilapidated wheelbarrow and take his guests diving in an outboard powered Boston Whaler. Today Peter Hughes is diving's most visible and respected operations expert, but he paid his dues to achieve that success. Long hours of very hard work on Bonaire were Peter's apprenticeship. Teach Tour did not survive the times, but Peter bought its few assets and took over as owner of Dive Bonaire.

Even in these formative years, the basic premise of Dive Bonaire was evident in terms of guest services. It may have been difficult for Peter and Alice to cope with the inconveniences of such an initially primitive operation, but the boat always left on time, guests never had to carry their own tanks and quality diving was always a number one priority.

As money became available, it was always reinvested in business improvements and Dive Bonaire continued to grow and prosper. The Boston Whaler

gave way to tri-hull flattops with outboards to augment diver comfort. Now the flattops have mostly been replaced by impressive V-hull and custom cathedral hull dive boats. More efficient compressors with backups and cascade air storage systems were put in place. Guest gear storage—conveniently close to the dive boats—was installed and guests were given the opportunity to choose among several dive options daily. Many of the operational procedures considered basic to any professional dive service today began as Peter Hughes' innovations at Dive Bonaire.

Flamingo Beach derived benefit in terms of Dive Bonaire's satisfied divers and, of course, Dive Bonaire enjoyed the benefits of a quality resort hotel from which to operate. Eventually this symbiosis matured into a business collaboration where Peter oversees the dive operations at various Divi resorts throughout the Caribbean, as well as the live-aboard dive boat *Sea Dancer*. Collectively, Divi Hotels and Peter Hughes Diving have come to define state of the art in the resort scuba diving industry.

The Divi Flamingo Beach Resort and Casino was where it all began and today it still boasts the highest repeat guest ratio of any Divi resort. Part of the reason rests with Bonaire's geographic desirability and part is owing to the efficiency and value of the Flamingo Beach/Dive Bonaire package. Bonaire is just 35 miles

(Continued on next page)



Left: Tube sponges (possibly *Verongia*) off Bonaire. Above: The interior of a room at Divi Flamingo Beach Resort and Casino. Below: ALM flies direct from Miami to Bonaire on weekends.



THE BUDDY SYSTEM REDEFINED

The buddy system is more than just a smart way to dive. It's St. Croix's premier watersports company pairing up with the island's best known and most complete resort hotel, to provide smart divers with unforgettable vacations.

The Buccaneer's classic accommodations, 144 luxurious rooms set amongst 248 landscaped ocean front acres, are world renowned. Championship golf and tennis, 3 superb restaurants, 3 private beaches, and much more are all on the property.

Caribbean Sea Adventures will boat you away to over 24 spectacular reefs in minutes. Now that's a buddy system you'll never forget.

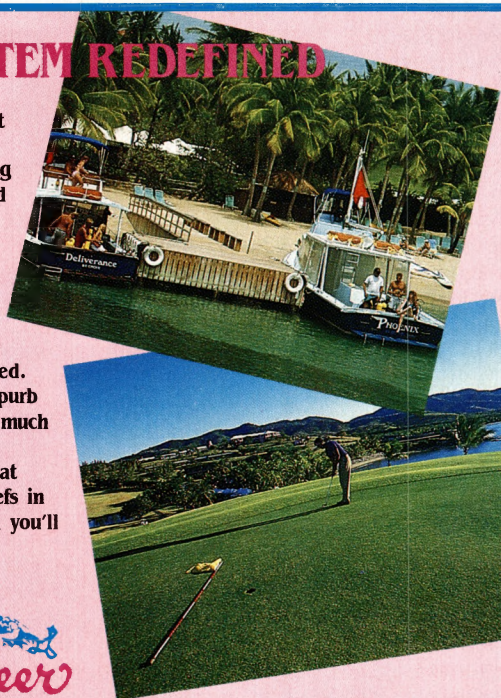


For complete vacation information see your travel agent or contact
Ralph Locke Islands, Inc. at Box 800, Waccabuc, NY 10597

Or call Toll Free:

1-800-223-1108

Up to the minute dive information is only a collect phone call away at (809)773-5922



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DIVI FLAMINGO BEACH

from the coast of Venezuela, nestled deep in the Caribbean and below the ravages of the hurricane belt. Consistently fine weather is one of the island's most appealing virtues. It is a comfort to traveling divers to realize that even in the dead of winter, when other dive resorts might be getting blown out, Dive Bonaire offers business as usual, including a money back guarantee in the remote possibility that a day of diving might ever be lost to equipment malfunction or weather.

The beauty beneath the sea further complements the scenic splendor of Bonaire and the warm, tropical ambiance of the island. A tremendous portfolio of dive options exists along the leeward shore of Bonaire and around the island of Klein Bonaire. (just a 15 minute boat ride from the Dive Bonaire docks). The basic reef profile consists of a gently sloping submarine terrace with thick concentrations of hard corals and seafans from 15 to 25 feet. At about 30 feet a steeply plunging drop-off is decorated with healthy hard corals, black coral, gorgonians, brilliant orange elephant ear sponges and some of the most impressive purple tube sponges found in the Caribbean.

Tremendous variety exists within this basic reef structure. All manner of reef tropicals inhabit these broad coral shelves, from macro creatures such as the seahorses and frogfish for which Bonaire is famous, to virtually every variety of moray eel, angelfish, butterflyfish, grouper and wrasse likely to be encountered in Caribbean waters. Occasionally "Mr. Big" will pass by and a few lucky photographers on Bonaire have come home with stories and/or photos of whale sharks, schooling dolphins, manta rays, eagle rays and even sharks (rare). But, the marine life on Bonaire is more reef tropical than pelagic. Most of the diving will be relatively shallow for greater bottom time and light, marine reef life and U/W clarity in the 80-110 foot range.

As Dive Bonaire continued to improve and upgrade, so did the Divi Flamingo Beach Resort and Casino. In addition to the 145 double rooms and suites—all of which are air-conditioned and have a balcony or lanai and support amenities such as the freshwater swimming pools, lighted tennis court, watersports (including sailboards, paddlecats and Sunfish sailboats), restaurants, bars and boutique—the property is also home to the world's only "barefoot casino," complete with slot machines, blackjack and roulette. This casino is not intended to convey the formal, stuffy atmosphere so prevalent in casinos elsewhere, but in keeping with the "casual elegance" theme of all Divi resorts, the Flamingo Beach casino invites its guests to come in shorts and T-

(Continued on Page 124)

BIMINI - BAHAMAS

"THE SHORTEST DISTANCE BETWEEN YOU AND WORLD CLASS DIVING"

— Rick Frehsee, Skin Diver Magazine

3 day/2 night p.p. dbl. (7 dives)

Deluxe
(Big Game Club)
\$383

'Hemingway'
(Complete Angler)
\$319

Economy
(Brown's Hotel)
\$300

Packages available from 2 to 8 days including Roundtrip airfare from Ft. Lauderdale or Miami, accommodations, room tax, ground transportation, and diving. Meal plans are available on Deluxe and Economy packages.

*Video Brochure available on request.

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P.O. Box 21766, Ft. Lauderdale, FL 33335

FAX (305) 763-6843

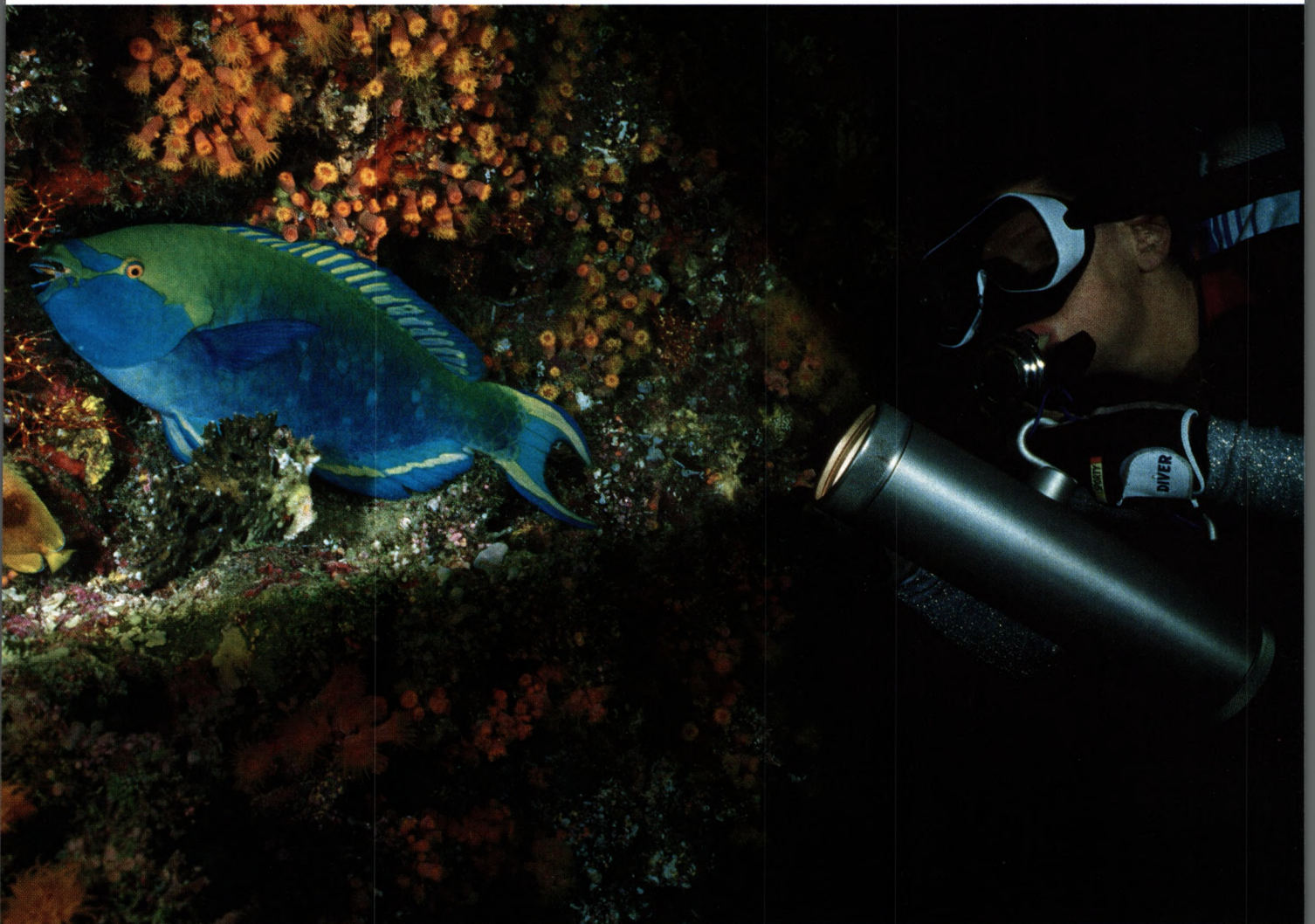
BIMINI BILL & NOWDLA KEEFE'S
UNDERSEA ADVENTURES

A Neal Watson Undersea Adventures affiliate



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THE NIGHTLIFE AT CLUB MED IS NOW EVEN MORE EXOTIC.



And the day life is as well. Because night diving is just one feature of Club Med's extensive diving program designed specially for certified divers.

To create the ultimate diving vacation we found exactly what divers are looking for. To begin, we've chosen two of the most colorful and unusual locales for our main diving centers: Turquoise in Turks and Caicos in the Caribbean and Sonora Bay in Mexico. Where you can swim alongside such underwater exotica as coral and tropical fish, and in the Sea of Cortez, sea lions and even an occasional whale.

To take full advantage of the sub-scenery we offer 2 dives a day, every day. And since we don't believe diving

should end with the last dive of the day, in the evenings we have seminars by visiting experts. Special dive dinners. And best of all—night diving twice a week, for an unforgettable experience.

The style with which you enjoy your dives is equally important. So we've designed customized dive boats and stocked the latest diving equipment, and load it on to the boats for you. We've built diving centers for rinsing and storage of equipment and we provide free use of video equipment. To satisfy your appetite as well as your sense of adventure we serve a delicious array of fruits, cheeses, chicken and ham on board, a popular feature at any hour.

When you do take off your

mask and fins you'll find all the usual amenities of an all-inclusive Club Med vacation. Sports like tennis, windsurfing and waterskiing. Three gourmet meals a day. And when you're not night diving, there's night dancing until dawn. All of which makes this the perfect vacation not only for you, but for your traveling companions who aren't diving fanatics.

So drop by your travel agent, visit your favorite dive shop, or call 1-800-CLUB MED ext. 86 for details. And see why the difference between Club Med's diving experience and all others is like night and day.

CLUB MED®
The antidote for civilization.™

CLUB MED'S WORLD OF SCUBA

At Club Med, you'll find a superior scuba program with diving at some of the most memorable sites in the hemisphere. We supply

the latest equipment, such as Scubapro regulators and gauges, plus all sizes of fins, masks, weight belts, and BC's. And if you're new to the

sport, we'll teach you the basics during our comprehensive Club Med Resort Course. Incredibly, all this is included in one pre-paid price.



Village	Water Temp. Summer/Winter	Underwater Visibility	Types of Dives	Depth of Dives	Sealife	Highlights
SONORA BAY (Mexico)	83°/65°	30'-75'	seamounts/ rocky islands/ wrecks/ canyons	20'-90'	seals, manta rays, sponges, whales, anemones...	Seal Island, night diving, Dedicated Dive Center
BUCCANEER'S CREEK (Martinique)	74°	50'-120'	reef/wall/ wrecks/caves	20'-100'	tropical fish, coral...	Excursions to Diamond Rock, Dedicated Dive Center in 1989
ELEUTHERA (Bahamas)	70°/ 65°-70°	50'-100'	reef/wall/ holes/grotto	15'-100'	tropical fish, groupers, coral, crustaceans...	Blue holes; kids diving lessons
MOOREA (Tahiti)	74°	150'	reef/wall/pass	30'-120'	tropical fish, coral, colorful shells...	Excursions to Tetiaora, Dedicated Dive Center in 1989
CANCUN (Mexico)	80°/73°	60'-80'	reef/grotto	12'-80'	tropical fish, dolphins, groupers, coral...	Excursions to Cozumel; excellent snorkeling
TURKOISE (Turks & Caicos)	80°-82°/ 76°-78°	50'-100'	reef/wall/ wrecks/ canyons/ grouper holes	50'-120'	tropical fish, dolphins, turtles, gorgonians, coral...	Coral wall, night diving, Dedicated Dive Center
MALDIVES Thulagiri and Farukolufushi (Indian Ocean)	79°	80'	reef/wall/ wrecks/cave	30'-90'	tropical fish, coral...	At Farukolufushi: Videotaping of dives available; Underwater photo lab; Slide shows of underwater life

In order to participate, all divers must certify that they are medically fit to scuba dive.

THE ULTIMATE DIVE EXPERIENCE

Expanded Scuba Programs for Certified Divers

Especially exciting is Club Med's specially-designed dive program at our Turkoise and Sonora Bay villages.

At **Turkoise**, situated on the island of Providenciales in Turks and Caicos, British West Indies, you'll find some of the best diving in the Caribbean—wonderfully clear waters abounding in a wide variety of tropical reef fish, turtles, eels, sponges and coral. At Provo's famous West Wall, you'll discover the vertical edge of the Continental Shelf, which begins at 35 feet, drops sharply to a small sandy shelf at 130-150 feet before plunging to an incredible 7,000 feet! Here is a diver's paradise with endless unexplored sites.

At **Sonora Bay, Mexico**, you'll witness the

sea canyons, sandy plains and seamounts of the Sea of Cortez. Swim among manta rays, whales and tropical fish in this yet unspoiled setting framed by colorful plants, anemones and sponges. The highlight of your stay at Sonora Bay will certainly be the full day excursions to Seal Island (weather permitting). Imagine diving once in the morning and then again in the afternoon among inquisitive, playful sea lions in their natural habitat!

The dive programs at **Turkoise and Sonora Bay** are designed with the certified diver* in mind. To maximize comfort and enhance the dive experience, our program includes:

- ▶ Two one-tank dives a day, every day, from our boats
- ▶ Tanks pre-loaded on dive boats

- ▶ Boats specially-equipped for diving
- ▶ A conveniently located dive shack for rinsing and storage of belongings and equipment
- ▶ Diving with either a Club Med guide or with a friend, using the Buddy System, at our predesignated dive sites
- ▶ Free use of video equipment
- ▶ A diver's rendez-vous center in the village where frequent seminars and video and slide presentations will be conducted by visiting experts

Courses of Instruction

We certainly did not forget all those who are new to the sport and are interested in mastering it. At Turkoise and Sonora Bay, courses earning Open Water Diver certification and

Open Water Check-Out certification are available in every major system (PADI, NAUI, SSI, CMAS, etc.) to the serious novice for an additional fee. For the already certified, Club Med offers you the opportunity to continue your scuba education with our specialty courses, such as Advanced Open Water Diver, Night Diver, Deep Diver, and others, available for an additional fee.

Whether it is your first or fiftieth dive, Club Med has a scuba program tailored to your level, the most comprehensive you'll find anywhere. And the Ultimate Dive Vacation is so easy to book... Simply call **1-800 CLUB MED ext. 86**, visit the travel department of your favorite dive shop, or see your travel agent.

**All international certification cards honored.*

CLUB MED®
The antidote for civilization.™

DIFFERENT DRUMMER DIVERS

Different Drummer Divers is a New York based tour operation specializing in unique, individually designed scuba diving trips. Destinations in 1989-90 include California, the Bahamas, Australia and the Red Sea.

The California trip in June will meet the desires of divers who want to dive the best of the Pacific Ocean's kelp beds. Three days will be spent on a boat in the Channel Islands; five days in a hotel on Cannery Row in Monterey, making day diving trips and visiting the famous Monterey Aquarium.

Two Bahamas trips, both aboard the *Bottom Time*, will introduce divers to two special escorts: Dee Scarr, operator of Touch the Sea dive tours in Bonaire, and Dr. Michael Smith, a curator of fishes at the American Museum of Natural History. Scarr will take the participants on underwater tours and Dr. Smith will be leading divers on a quest for the elusive cuskeel. Dates will be July 23 to 29 and July 30 to August 5, making it possible to make both trips from Nassau.

An October trip combining the Australian rainforest and the outer reefs of the Coral Sea will benefit the Divers Alert Network (DAN).

In June of 1990, Dr. Eugenie Clark, renowned ichthyologist, writer, lecturer and professor at the University of Maryland, will lead a trip to the southern Red Sea, from Djibouti to Port Sudan, aboard the *Lady Jenny*.

Naomi Stern is Different Drummer's tour organizer. She has been diving for 26 years and has five years' experience in the dive travel business. For further information, contact her at Different Drummer Divers, 100 West 81 Street, New York NY 10024; (212) 873-4059.

ADVENTURE VEHICLE DYNAMICS GROWTH

Adventure Vehicle Dynamics Inc. (AVD) continues to enjoy a rapid increase in its sales orders. AVD has shipped 16 SportSubs since starting production in July of 1988. There are 15 units on order.

AVD is looking forward to the opening of its own tourist resort operations in Florida and Hawaii during the next few months. These operations will provide SportSub tours of the local reefs and underwater attractions to tourists.

AVD has also begun a joint venture with the world's largest diving cruise liner, *Ocean Quest*. *Ocean Quest* will use up to four SportSubs to provide underwater rides to the 350 scuba divers on board. The ship cruises between New Orleans, Cancun, Cozumel and Belize on a weekly schedule.



Scuba-divers from all over the world flock to Curaçao's National Underwater Park. Colorful coral reefs and exotic marine life fascinate both advanced and beginner divers. On land, sun-worshippers can choose from 38 scintillating beaches. Gamble in glamorous casinos until dawn. Elegant shopping. Restaurants, dancing, culture and so much more. Curaçao. If we spell 'scuba' in our own unique way, it's because we have a style all our own.

CURAÇAO

Caribbean charm with a Dutch accent

For details contact your travel agent or The Curaçao Tourist Board, 400 Madison Avenue, NY, NY 10017 (212) 751-8266 or (800) 332-8266

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Divers...COME LIVE IN LUXURY ON BONAIRE

Full Service Dive Resort
With All The Comforts Of Home.

- Beautiful beachfront studio, 1, 2, and 3 bedroom condos, with fully equipped kitchens.
- Full service PADI training facility operated by Andre Nahr.
- Complete U/W photography and video services, including rental, repairs and instruction.
- 24-hour beach diving available, in addition to scheduled trips on our uncrowded new boats.
- Special snorkel trips and learn-to-dive pkgs. available.
- Enjoy casual dining from 7:30 a.m. to 11 p.m. at the Green Parrot, our oceanfront restaurant.
- Coming soon... swimming pool, tennis courts and shopping.

Sand Dollar Beach Club A Condominium

Bonaire, Netherland Antilles
For Sales and Dive Package Information
Contact Sand Dollar: 50 Georgetown Road,
Bordentown, NJ 08505

1-800-345-0805

in NJ call (609) 298-3844 for Sales Information
or (609) 298-2298 for Dive Package Information

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CLUB MED

SONORA BAY



On Mexico's Sunny Sea Of Cortez

TEXT AND PHOTOGRAPHY
BY MICHEL VERDURE

Almost everyone has heard of Club Med. With more than 100 villages worldwide, Club Med has earned its reputation for providing an ideal "antidote for civilization." For one all-inclusive price, Club Med guests are over-indulged with great food, service, entertainment and every imaginable sport. Although Club Med has been turning island travelers on-to scuba diving for years, it's only been in the past year that it has gone all out to offer the certified diver the same over-indulgence that every other visitor enjoys.

To initiate its dedicated diving program Club Med chose Club Med Turquoise in the Turks and Caicos and Club Med Sonora Bay on the northwest coast of Mexico.

Jeff Bynens, director of scuba diving operations for all Club Meds, customized dive boats and dive shops, and assembled equipment, staff and training facilities that have redefined the term state of the art.

Imagine hot pink and turquoise aluminum tanks and color coded weightbelts and you'll begin to get the idea.

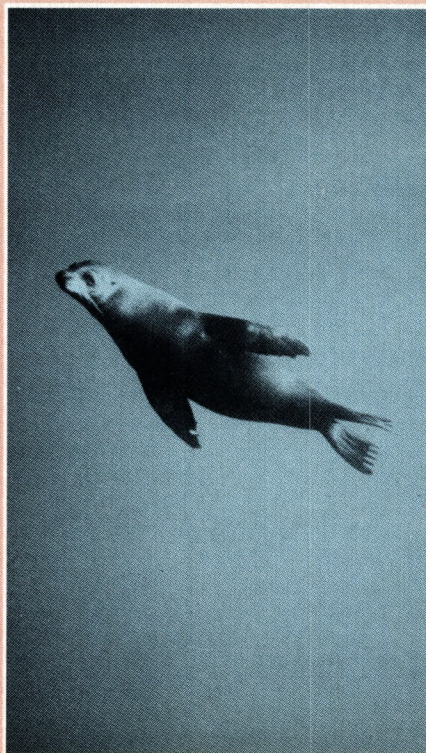
Service is nothing new to Club Med, so all of a diver's needs have been met. There are mesh bags and storage facilities for all gear, including an area to hang wetsuits. Rinse tanks, hot showers and restrooms are right at the dive shop. Scubapro regulators and BCs, Dacor masks, fins and snorkels and Henderson wetsuits are all stocked for guests' convenience. Dive lights and underwater video equipment are also available. And now for the good news: Club Med does not believe in extra charges—all diving and equipment are included in the standard package price!

At Club Med Sonora Bay, tanks are pre-loaded onto the comfortable customized *Dominador*. Guests need only board the boat, then relax on the sundeck or the benches along the main deck.

There's a wide dive platform for easy entry and exit. Guests can descend on the anchorline or a weighted line dropped from the stern. There are two decompression bars for easy hanging, equipped with octopuses and surface supplied air



Club Med Sonora Bay is just south of Guaymas on the Mexican mainland and offers certified scuba divers the same over-indulgence every other visitor enjoys.



as an added safety measure.

Two tank morning dive trips leave Sonora Bay daily. Beach diving is also available. The diving you will experience at Club Med Sonora Bay is different from what you may be used to in the Caribbean. In the Sea of Cortez the diving conditions are a little less predictable and a lot more exciting. The consensus is that there are four good reasons to dive at Club Med Sonora Bay: the seals, the sea lions, the seamounts and, in the winter, the whale sharks.

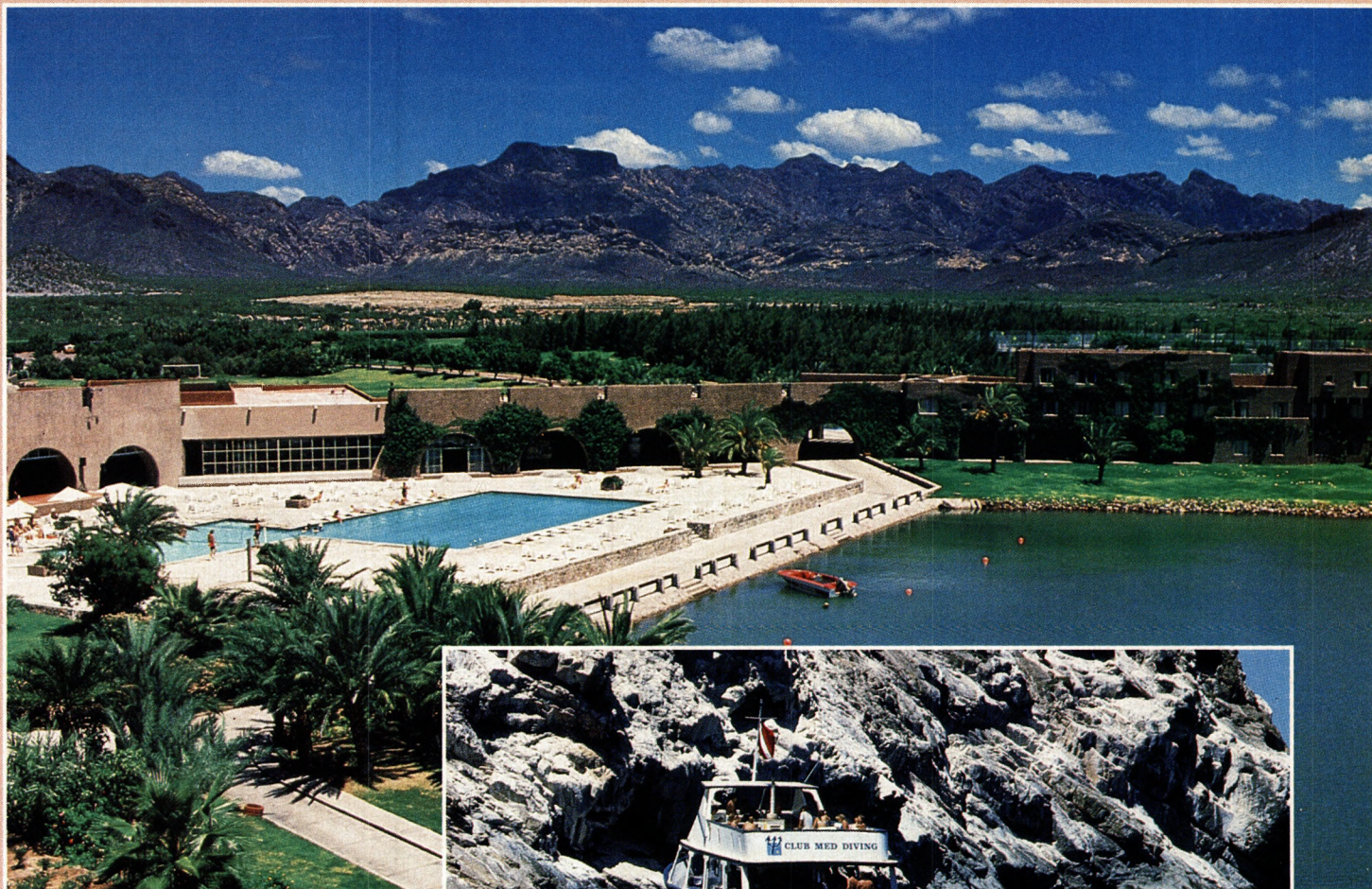
The seamounts provide colorful canyons and caves that are home to manta rays, large pufferfish, larger parrotfish and even larger groupers. As you may have guessed, the operative word used in diving the Sea of Cortez is "large."

For many, the most exciting animals are the sea lions. Twice weekly trips to **Seal Island** are scheduled, weather permitting. Here, hundreds of sea lions glide effortlessly beside you, barking friendly greetings as they go. Those of you that have never experienced these endearing mammals up close, are in for a unique and unforgettable experience. Those reluctant to leave their new-found friends will be happy to hear Club Med has made the return trip as pleasurable as possible. After sampling the fresh breads, tropical fruits, meats and cheeses on board the boat, you'll be refreshed and ready for your next sea lion dive.

Club Med Sonora Bay's sports program is one of the most complete in all of the villages. There are intensive programs in tennis available on the 29 courts. After a siesta poolside, the windsurfing, sailing, waterskiing, fitness room, aerobics classes and golf putting course await you.

Club Med Sonora Bay is also a dedicated horseback riding center. With lessons offered in both western, English and dressage, the club caters to the beginner and to the most advanced rider. If you enjoy horseback riding, or the thought of trying it, this is the place for you!

Club Med Sonora Bay is between the
(Continued on next page)



Club Med Sonora Bay is between the Sea of Cortez to the west and the Algodones Mountains to the east. There is an exciting variety of activities available to guests, including scuba diving—all at no additional charge. (Certification courses are extra.) The resort's dive boat, the *Dominador*, is fully customized for diver convenience.





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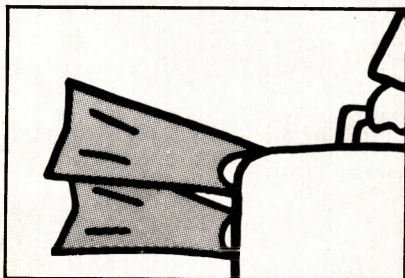
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CLUB MED SONORA BAY

Sea of Cortez to the west and the glorious Algodones Mountains to the east. A garden of hundreds of oversized cactus welcomes you into a sprawling complex with breathtaking views in every direction. The club's rooms and motif all blend perfectly with the landscape.

In the evenings you may want to slow down a bit and enjoy a leisurely dinner in one of the three restaurants. Local mariachi dancers, club shows and the disco are sure to keep you entertained.

More active guests can plan on twice weekly night dives, an evening game of tennis on one of the 14 lighted courts or an overnight horseback riding excursion. Or, lie back with a margarita and do nothing more strenuous than watch the exceptional sunset. At Club Med, the choice is always yours.

If all this is not enough to convince your nondiving friends to come along, how about enrolling them in a PADI, NAUI, SSI or CMAS certification course for just \$100? Other scuba specialty classes are also available. Ready to go? Club Med Sonora Bay is accessible by Saturday charters direct to Guaymas from Los Angeles and Phoenix. There are connecting flights from San Jose and Oakland to Phoenix as well. There are also regularly scheduled daily flights from Tucson. Once in Guaymas, a 15 to 20 minute taxi ride takes you to the Club Med village.

If you live in the southwest another option is driving to Sonora Bay. My wife and I thoroughly enjoyed a four and one-half hour drive from Nogales, Mexico to Sonora Bay on good roads with wonderful Mexican vistas. I have been to Sonora Bay three times and am anxious to return. It is truly a unique experience both underwater and topside. For information and reservations call (800) CLUB-MED. 🐠

LIONS DIVE HOTEL

The newly opened Lions Dive Hotel is on the island of Curacao, next to the Seaquarium, beach and dive store. Recently, Lions Dive Hotel won the Chamber of Commerce and Industry Award of Tourism. This award was given to the hotel for its outstanding contribution to the Curacao tourism industry.

The Lions Dive Hotel has 72 beautifully furnished rooms, all with a balcony or terrace overlooking the ocean. Rumours, a colorful bar/restaurant, offers its guests the very best for all their needs.

Because of its location at the Seaquarium Beach and Underwater Curacao, the Lions Dive Hotel is ideal for divers as well as nondivers.

For information call (800) 451-9376 or (800) 328-5285 or, in Canada, call (800) 265-1692 or (800) 468-0023. 🐠

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From **June 1–October 31, 1989, 4 days/3 nights** are as low as **\$330.00** and **8 days/7 nights** start at **\$720.00**, both per person, double occupancy.

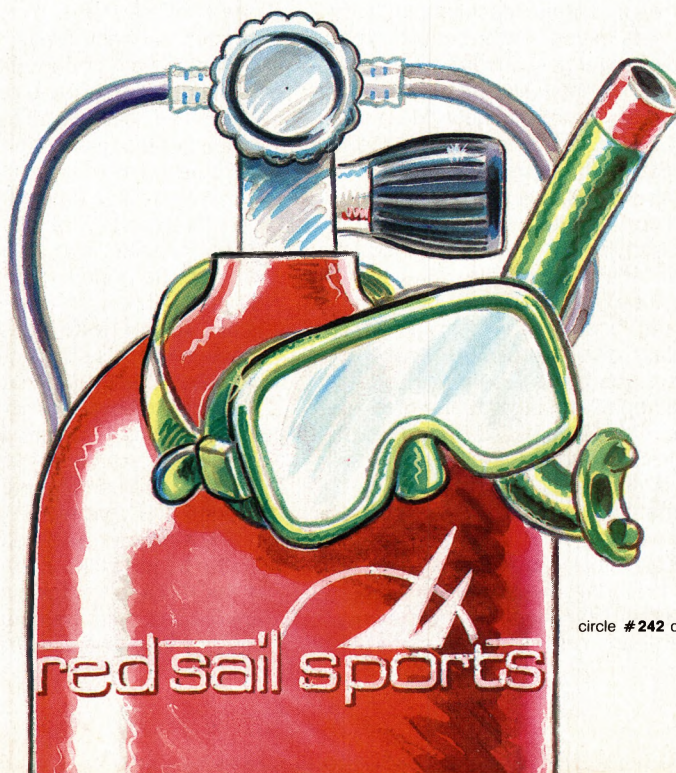
In **Aruba**, see Red in two new locations, at the Americana Aruba Beach Resort & Casino, 419 rooms newly renovated and expanded, along the white sands of Palm Beach. Here is paradise for divers, windsurfers and sailing romantics who can ride the Aruba winds on a 49-passenger, custom-built catamaran, the Balia.

In Harbortown, Aruba's new seaside shopping hub, Red Sail Sports has collected all the color and culture of the Island in our Shop and Watersports Centre, where you can browse fun beachwear, accessories and a charming collection of local artist offerings, and arrange for any of Red Sail's watersports adventures.

Special dive packages are available at Red Sail Sports locations in Grand Cayman, BWI, Hawaii and Aruba by calling our dive experts toll free

800-255-6425.

All package prices subject to local taxes and slightly higher prior to June 1. Includes two-tank dives for each day of package, excluding arrival and departure days, and tanks and weights for scheduled dives.



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curacao

A NEW STAR RISES IN DIVING'S SOUTHERN SKY

seascape

TEXT AND PHOTOGRAPHY BY STEPHEN FRINK



Curacao offers a variety of strikingly beautiful vistas.

inches of annual rainfall), with minimal freshwater runoff to mar U/W visibility. The yearly average temperature is a balmy 82°F. Much of the best diving is protected from the wind by the profile of the island. There is even a small island offshore, Klein Curacao, that will provide even further underwater adventure.

Curacao and Klein Curacao have the massive concentrations of coral and marine life that invite scuba divers. These, coupled with sophisticated tourism infrastructure including easy air access, superior resort hotels, excellent duty free shopping, casinos, nightlife, fine dining and a beautiful island topography, will inevitably invite ever greater dive tourism. But for now, Curacao represents a marine wilderness and an excellent opportunity to experience something new. Most of the sites have had few visitors and consequently are void of scars caused by careless divers. Standing at the vanguard of Curacao's emerging dive operations is Curacao Seascape.

Curacao Seascape Dive and Watersports is a modern new facility at the Curacao Caribbean Hotel Casino. Dive operations director Chris Richards is an affable long-time Curacao resident (he was born in England but has lived in Curacao for 27 years). He not only knows the local waters, but also what is necessary to make a first class dive operation a reality. After having worked first as a divemaster and scuba instructor at the Coral Cliff Hotel and then serving as manager of the dive operation at Underwater Curacao, Chris is qualified both by experience and temperament to direct Curacao Seascape. The marketing end of the operation is enthusiastically handled by Gabriela Menvielle. Gabriela and Chris are the perfect hosts for Curacao Seascape and are working very hard to ensure their current clientele becomes their future repeat clientele.

Curacao Seascape began offering dive charters in May of 1988 and has already inaugurated significant improvements to the operation. Boats were an early priority and the first major

The secret is out—there is a new emerging star in the Caribbean dive constellation. Curacao has been discovered. It is surprising that this gem of the Netherlands Antilles should have remained dormant, at least as far as underwater exploration, for even this long. Neighboring Bonaire, just 30 miles to the west, has been a perennial favorite of traveling divers and many of the same factors recommending Bonaire are equally evident in Curacao.

Like Bonaire, Curacao is just 35 miles north of Venezuela, well outside the hurricane belt. Also, the frequent cold fronts that might disrupt diving in other parts of the Caribbean have no influence here. The island is basically arid (only 21

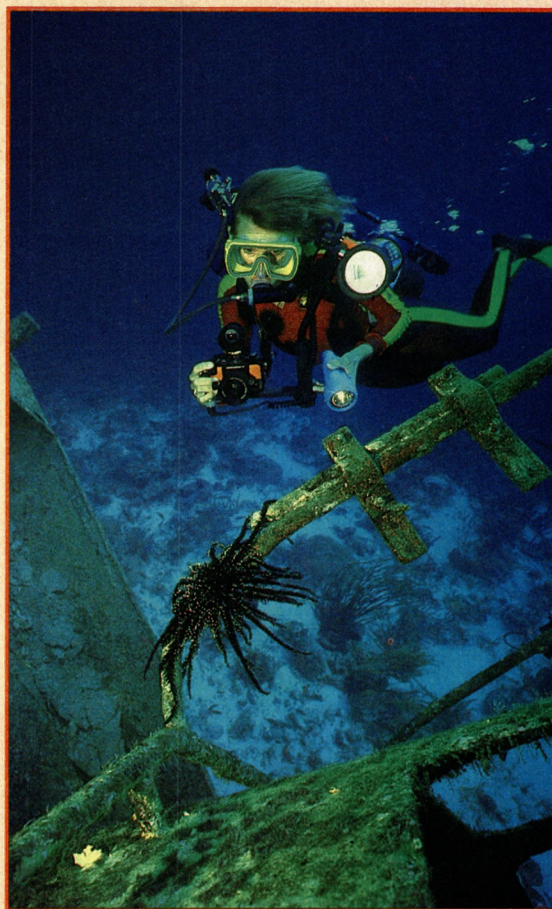


Curacao Seascape is a modern dive facility conveniently located on the beach at the Curacao Caribbean Hotel Casino.

investment was a 38 foot Delta fiberglass V-hull. The *Caribbean I* is powered by twin 250 horsepower Detroit diesels and will cruise at 16 to 18 knots quite comfortably. As would be expected of a custom boat, there are tank racks, storage under the benches for individual gear, an oversized water level dive platform with extended ladders, and marine electronics. There are also convenience features such as a freshwater shower, functional marine head and an upholstered V-berth. The *Caribbean I* offers shade and protection from sea spray and the expanded sundeck areas on the bow and above the dive deck provide ample opportunity to soak up Antillean sun rays. When I visited Curacao Seascape in early February, a new addition to the dive fleet was already in transit from its Florida boat yard. From the blueprints and pictures I've seen, it is obvious the *Caribbean II* will be the queen of the Curacao dive fleet. The 65 foot South Seas catamaran will serve multiple duties for Curacao Seascape. She will be a fast (22 knots delivered by twin Detroit diesels) and stable platform for the daily charters and will also be popular with snorkelers and glassbottom boat enthusiasts. The unique hull design incorporates a pair of hydraulically driven oval glass viewing windows. While underway these plexiglass shafts can be raised for speed and while idling over coral reefs, they can be extended to provide an intimate view from above. For exploring new dive sites, as well as for combinations of divers and nondiving spouses, the glassbottom option will be a tremendous convenience. The *Caribbean II* will also be used for sunset and moonlight cruises and all day snorkel and dive excursions to Klein Curacao.

The Curacao Seascape dive center is conveniently located on the beach at the Curacao Caribbean Hotel Casino. The boat is docked a few steps away from the dive shop and since tanks are loaded onto the dive boat by the staff, any inconvenience to Seascape guests is held to an absolute minimum. A 27 cfm

Right: Curacao Seascape's dive operations director Chris Richards and Gabriela Menvielle. Far right: There are several ships off Curacao that were sunk intentionally to form artificial reefs. Below: The Curacao Caribbean Hotel Casino is a very modern 200 room resort.



Above: Interior of a room at the Curacao Caribbean. Right: Curacao Seascape's 38 foot dive boat *Caribbean I*. The operation's vessels are customized for divers and the new *Caribbean II* has U/W viewports.



Davey compressor with 10,000 cubic feet of cascade air storage provides the heartbeat of the scuba service. Individual guest gear storage lockers are available at the dive center, so only personal camera gear need be carried to and from the rooms daily. The hotel lobby is perhaps 150 yards from the dive center and elevators facilitate access to any of the rooms in this five floor resort complex. In addition to diving, snorkeling, sportfishing and waterskiing, the watersports center also offers Jet Skis, sailboards, paddleboats, waverunners, tubies, waterscooters and a second glassbottom boat. With such a complete range of sporting options, fine diving and snorkeling just offshore and twice daily dive boat excursions, as well as boat and beach night dives, Curacao Seascape has something to offer just about anyone who loves active watersports.

For diving enthusiasts, the sites visited by Curacao Sea-

scape range from the western tip of the island, all the way to Klein Curacao, 16 miles due east of the main island. At least 30 sites are regularly visited by the operation, so it is unlikely that anyone on a standard one week dive package will ever visit the same place twice. Diving off Curacao is only now an emerging industry, so the underwater resource has not been exploited. The government shows every indication it intends to preserve the reefs for future generations. A portion of the southern coast of the island has already been protected by the creation of the National Underwater Park, established in 1983. Stretching from the Princess Beach Hotel to the eastern tip of the island, from the high water mark to the 200 foot depth contour, the park covers a total surface area of 1,500 acres. Mooring buoys are in place to assure that the reef is left undamaged

(Continued on Page 94)



Photography by Jim and Cathy Church.

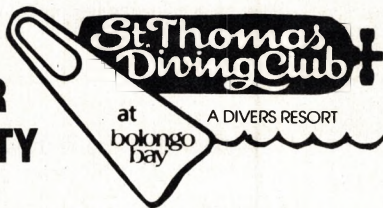
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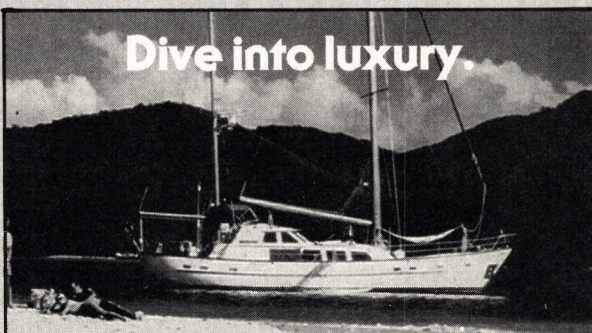
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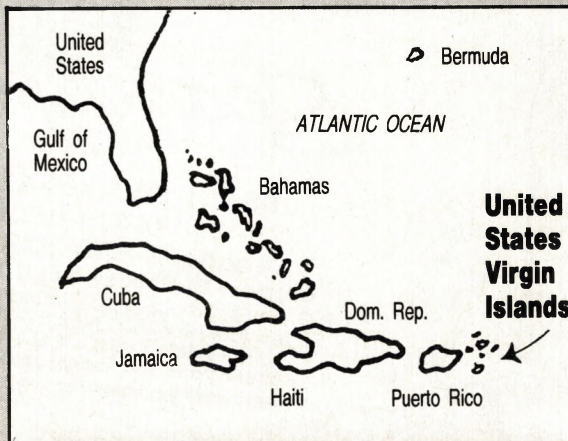
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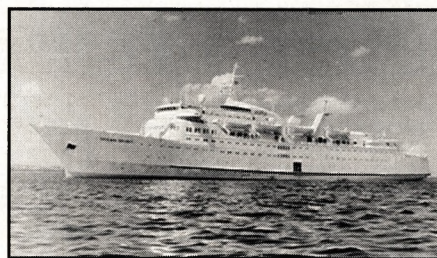
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growing aquatic sports. The *Ocean Spirit* is a multi-faceted floating resort, containing a disco lounge, gambling casino, restaurant, passenger lounge, casual bar, movie theater, duty free shop, beauty shop and swimming pool. The restaurant, bar and galley have been completely rebuilt according to the hygienic standards, rules and requirements of the United States Public Health Service. In this regard, strict environmental controls have been installed including a modern, self-contained waste treatment and storage system that completely eliminates all waste disposal at sea.

For further information contact Ocean Quest International, 512 S. Peters St., New Orleans, LA 70130-1629; (800) 338-3483 or (504) 586-8686.

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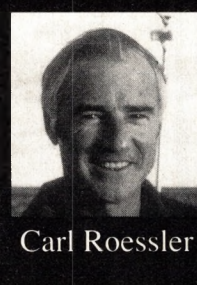
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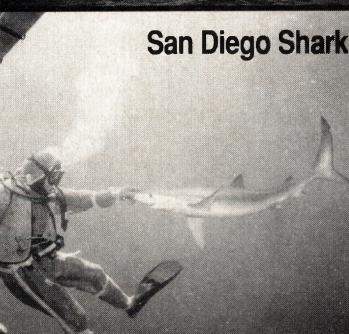
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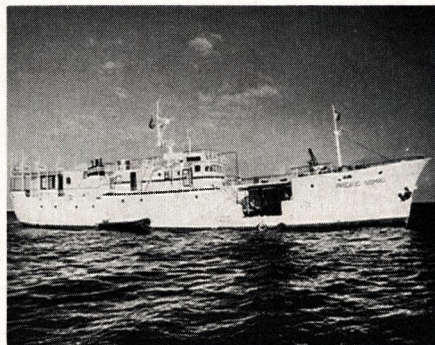
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See & Sea Travel of San Francisco is offering special low season rates for the 115 foot dive cruiser *Pacific Nomad*. Cruises chartered during the months of November through March will now be offered at a rate of \$1,300 per person. During the prime conditions April through October, the cruises are offered at \$1,500 per person.



Pacific Nomad is also hosting a Doppler decompression research cruise August 16-27. The seminar will include some divers wearing recorders to develop decompression data, plus expert presentations on decompression theory, tables and computers. Host Karl Huggins is a co-developer of the Edge decompression computer; his co-host, Dr. Tom Newman, is director of the San Diego Hyperbaric Medical Center.

For further information, contact See & Sea Travel, 50 Francisco Street, Suite 205, San Francisco, CA 94133 or call (800) DIVE-XRPT; in California call (415) 434-3400.

BONAIRE GUIDES

The new English version of the *Travelers' Handbook to Bonaire*, by Rein Vander Helm, is now available for purchase. This version was made through the sponsorship of the Bonaire Trading Company. The handbook is a comprehensive guide containing practical information on restaurants, hotels, watersports activities and island sights, along with insight on the history of the island and cultural activities. A wide variety of the facts is contained in the guide and will be most helpful in planning your next vacation.

The *Travelers' Handbook* can be purchased on Bonaire for \$15 or, for \$18 it can be airmailed to any U.S. or European address. To obtain your copy, send a personal check, drawn on a U.S. bank, to Bonaire Trading Company, P.O. Box 115, Bonaire, Netherlands Antilles.

Additionally, the popular *Guide to the Bonaire Marine Park* book is once again available through Bonaire Trading Company. It can be obtained from the above address.

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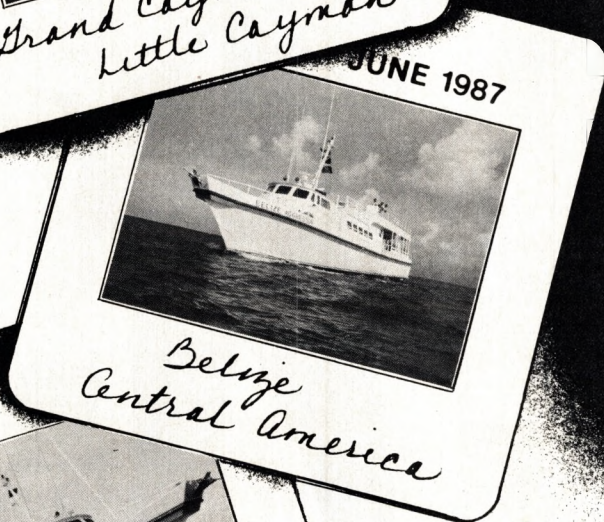
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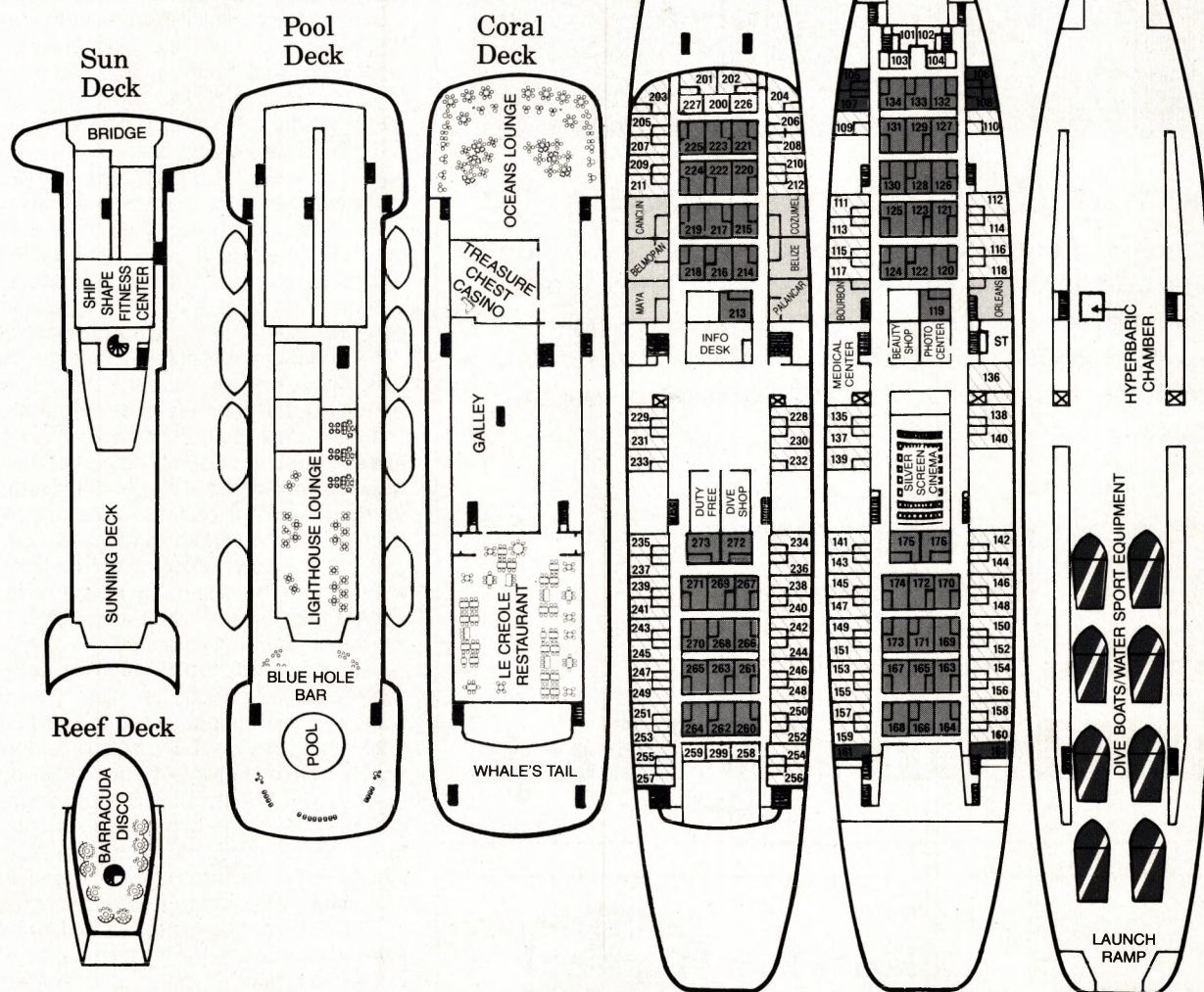
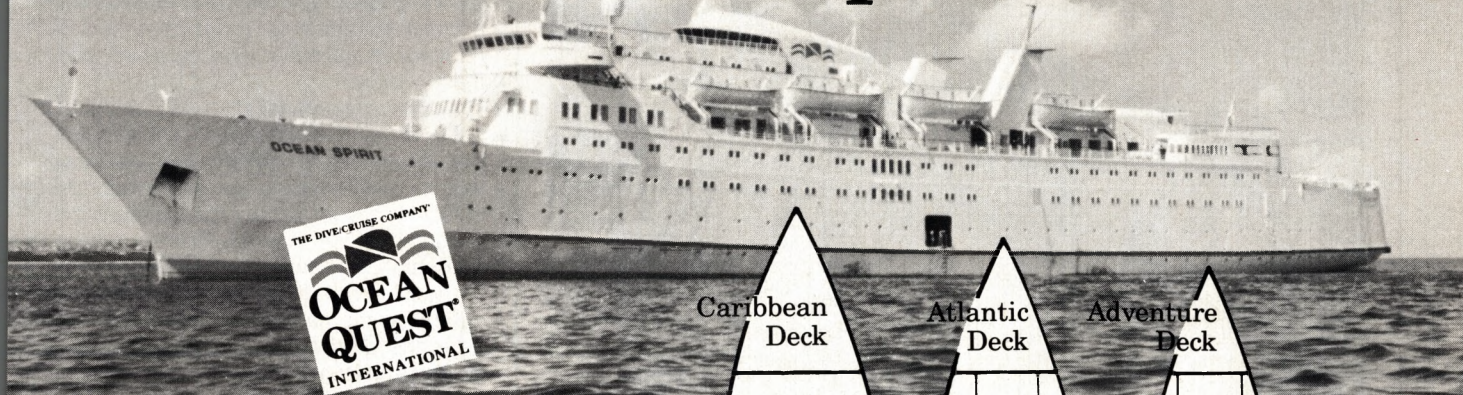
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CURACAO SEASCAPE

(Continued from Page 85)

by misplaced anchors and regulations prohibit spearfishing, coral collection or removal of anything alive or dead from these waters.

Among my favorite dive sites accessible from Curacao Seascape, **Klein Curacao** is the most distant and perhaps most exotic. The island is a two and a half mile oval with a spectacular sand beach and picturesque lighthouse. There is diving on both the windward and leeward sides of the island, but weather conditions will determine the day's dive options.

On the windward side, nearly 90 percent of the coast falls off to a dramatic wall plunging from about 20 feet to 180. It is here the pelagics play. If turtles can be considered a predictable sighting anywhere, this may be the place, and manta rays, schooling jacks, barracuda and huge groupers frequently appear.

There is wall diving along the leeward shore as well and since there is occasionally a current, these dives are sometimes drifts. Because of the flow of nutrients, filter feeders abound and huge elephant ear sponges, massive purple tube sponges, crinoids and thick concentrations of black coral are commonplace. With underwater visibility of up to 150 feet, Klein Curacao offers spectacular opportunities for underwater photographs.

If Klein Curacao can be considered the easternmost point of the day dive range, **Mushroom Forest** is one of the favorites from the western end. This site features excellent concentrations of hard corals that, surprisingly, grow nearly up to the ironshore of the island. There is a cavern carved from the rock and within the cavern there are always schools of copper sweepers and, occasionally, huge swarms of silversides as well. To seaward the reef slopes off very gradually until, at about 50 feet, the bottom features an incredible density of star, brain and pillar corals. Many of the mountainous star corals have grown into curious mushroom formations, hence the site's name. The undersides of these corals are encrusted with orange and red sponges.

While Klein Curacao and Mushroom Forest represent the extremes of the range, excellent diving is also available nearby. In fact, the shore dive off the Curacao Caribbean is quite fascinating. While snorkeling here I was surprised to see flying gurnards grazing and lizardfish buried in the sand. Upon closer inspection I found the remains of an old underwater pen (apparently used for dolphins at one time) and discovered several seahorses among the refuse. Beneath the pier is the unsightly debris that might be expected—old tires, a lawn chair or two and hundreds of bottles—but after years in the sea these discards have assumed a new identity. Sponges grow on some

and plumeworms have claimed others. The pilings are thick with macro encrustation and scorpionfish, juvenile angelfish and moray eels inhabit this casual artificial reef. The wide angle vista leaves something to be desired here, but there is a rich texture to the macro ecosystem. The seaward shoreline off the hotel is more of a traditional Curacao drop-off, with hard corals and seafans in 20 feet of water. A fairly precipitous slope from 25 to 120 feet is thick with orange elephant ear sponges, black coral, crinoids, tube and barrel sponges. Schools of brown chromis populate the reef face.

Other nearby dives include the **Blue Wall**, a drift dive only 10 minutes from the resort, where one afternoon Chris was surprised to have a close encounter with a free swimming sailfish. **Bart's Wall** is best known for a huge crevice in the wall face habitually populated by a huge green moray eel.

There are several intentionally placed shipwrecks off Curacao, but the **Superior Producer** is the most impressive. A 200 foot freighter accidentally sunk in 1977 in just 100 feet of water off Holiday Beach, the **Superior Producer** sits perfectly upright and has acquired substantial colorful encrustation over the past decade. There are splashes of red, purple or orange sponges coating much of the metallic surfaces and orange cup corals predominate around the wheelhouse. I haven't had the opportunity to dive the ship at night yet, but presume when all the *Tubastrea* are feeding with polyps extended, it must be magnificent. The bow is particularly photogenic with its ladders and booms lying in disarray. A resident green moray eel, occupying a rope locker, has no fear of divers despite countless strobes fired in its direction.

The Curacao Caribbean Hotel Casino is a modern 200 room resort complex complete with four restaurants, three bars, freshwater swimming pool, lighted tennis courts, convention facilities, health club, boutiques and casino featuring slots, blackjack, poker, roulette and craps. The rooms are, of course, air-conditioned and offer ocean views, radio, color cable television and a balcony or lanai. The resort is only 10 minutes from the airport and five minutes from picturesque Willemstad. Individuals, families and both divers and their nondiving companions will find plenty of recreational activities here. With the resort ambiance of the Curacao Caribbean and general tourist attractions of Curacao, coupled with the efficient professionalism of Curacao Seascope, an exciting new option is now available in the Caribbean.

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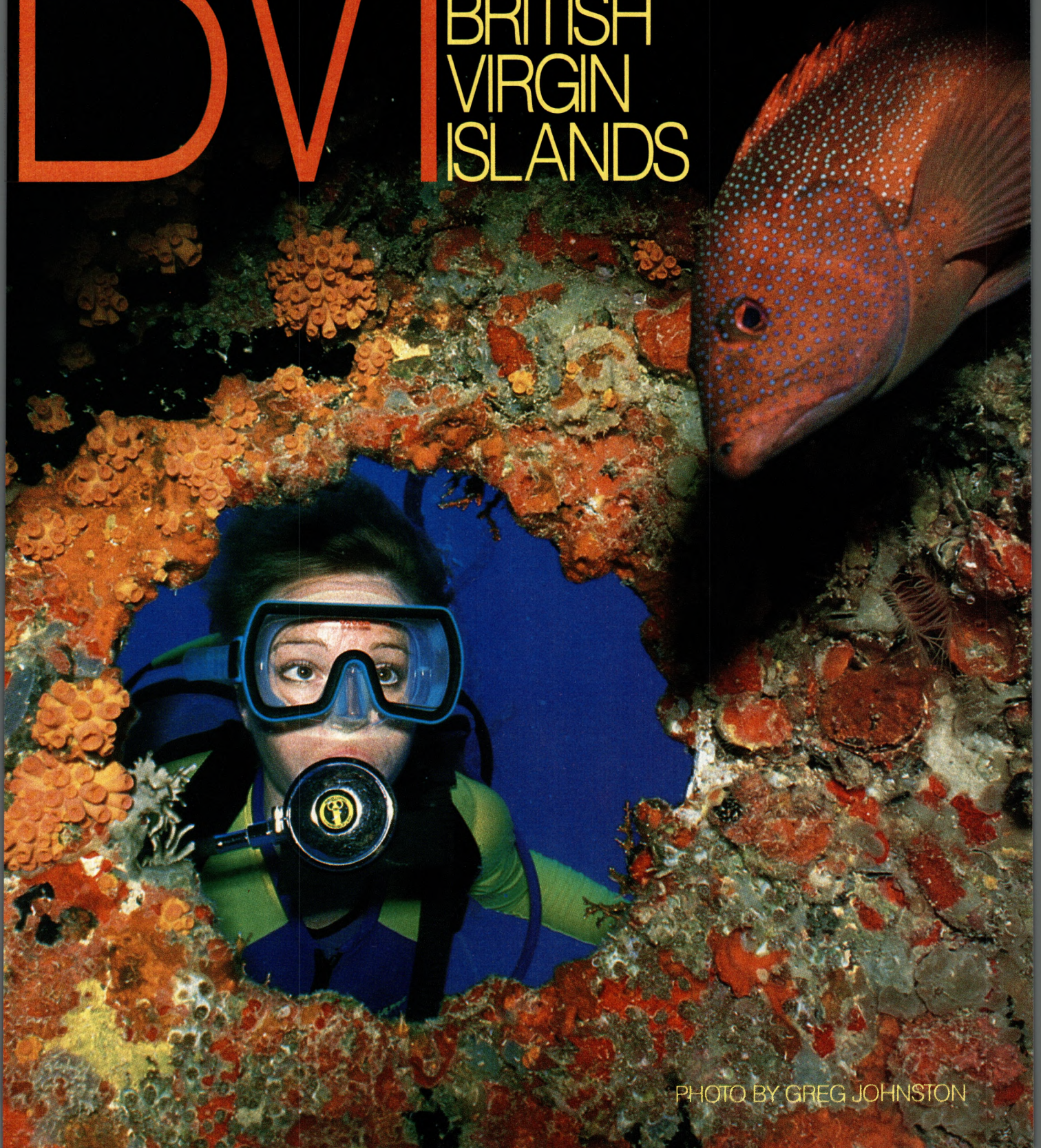


PHOTO BY GREG JOHNSTON



A colorful school of blackbar soldierfish.



Relaxing on the beach at Cane Bay Garden.



The immense propeller of the *Chikuzen*.

Enjoying a drink at Bitter End Yacht Club.



TEXT AND PHOTOGRAPHY BY
GREG JOHNSTON

More than 50 specks of land lie scattered across the Caribbean Sea some 75 miles east of Puerto Rico. Each is a tiny tropical island, with rugged green mountain slopes that appear afloat in a blue-green kingdom. There is a magical ambiance of romance everywhere and

A photograph of a sailboat on the water, with a large mountain in the background. The sailboat is dark, and the water is light. The mountain is a soft, hazy blue. The sky is a pale blue. The overall mood is serene and beautiful.

T H E B R I T I S H VIRGINS

**SERENITY AND BEAUTY ON THE
CARIBBEAN SEA**

tales of buried pirate treasure echo through each sun-danced bay. Offshore, sleek hulled boats with colorful spinnakers slice the crests of frothy waves like arrows shot through mist. These are the British Virgin Islands, just a short distance from the U.S. Virgin Islands.

The British Virgin Islands, a self governing colony within the British Commonwealth, have a history that mingles the Dutch influences of St. Croix and St. Thomas with the French influence of St. Maarten. The multi-faceted history of the BVI dates back to the islands' pre-Colum-

bian inhabitants. Originally from South America's Orinoco Basin, these Amerindians first migrated to the lesser Antilles; then later to what is the present day British Virgin Islands. A second wave of Indian inhabitants known as the Tainos (often referred to as the Arawaks) settled

THE BRITISH VIRGINS

in the Virgins, which were discovered by Columbus on his second voyage in 1493.

In the years after Columbus' discovery, other known seafarers sailed throughout the British Virgin Islands. Sir Francis Drake (after whom the deepwater channel is named) and his colleague, Sir John Hawkins, visited the islands in 1570. At the time of Drake's visit, the islands were Spanish—but not for long. Control of the islands was transferred many times among Spain, England, Holland and France, until England gained firm control in 1699. However, most of the islands remained uninhabited until such adventurers as Edward Teach (alias Blackbeard), Jost Van Dyke and other notorious sea outlaws found the Virgin Islands the perfect haven from which to launch their piratical raids.

Today, these islands bear such imaginative names as Fallen Jerusalem, Ginger Island, Great Camanoe, Necker Island, Jost Van Dyke and Deadchest, to name a few. Each has its own character and some were named for physical char-

acteristics: Fallen Jerusalem was named for the giant boulders that resemble the ruins of the ancient city; Great Dog was also named for its appearance. Others carry the names of notorious pirates, such as Jost Van Dyke and Great Thatch (after Edward Teach). Deadchest, one of the most infamous, is a scrub covered islet and reportedly the site where Blackbeard abandoned his mutinous crew with no more than a saber and a bottle of rum. Today, many of the English speaking islands' people are direct descendants of these early adventurers.

Tortola is the largest of the Virgins and has a population of about 9,000 people (the total BVI population is about 12,000). Here, the jagged mountain peaks, covered with frangipani and fragrant oleander, characterize the beautiful vistas of the perfect Caribbean vacation. The gently sloping mountains roll into deep valleys with groves of bananas, mangoes and clusters of coconut palm trees. The verdant landscape is separated from the aquamarine sea by a white powdery sand beach that fringes the island. The highest peak—1,780 feet—can be found at Mount Sage National Park. Traces of a primeval rainforest can still be found on the mountain's slopes.

The main center of activity is in the rustic village of Road Town, the busy capital of the BVI, as well as the central administrative and business center of the territo-

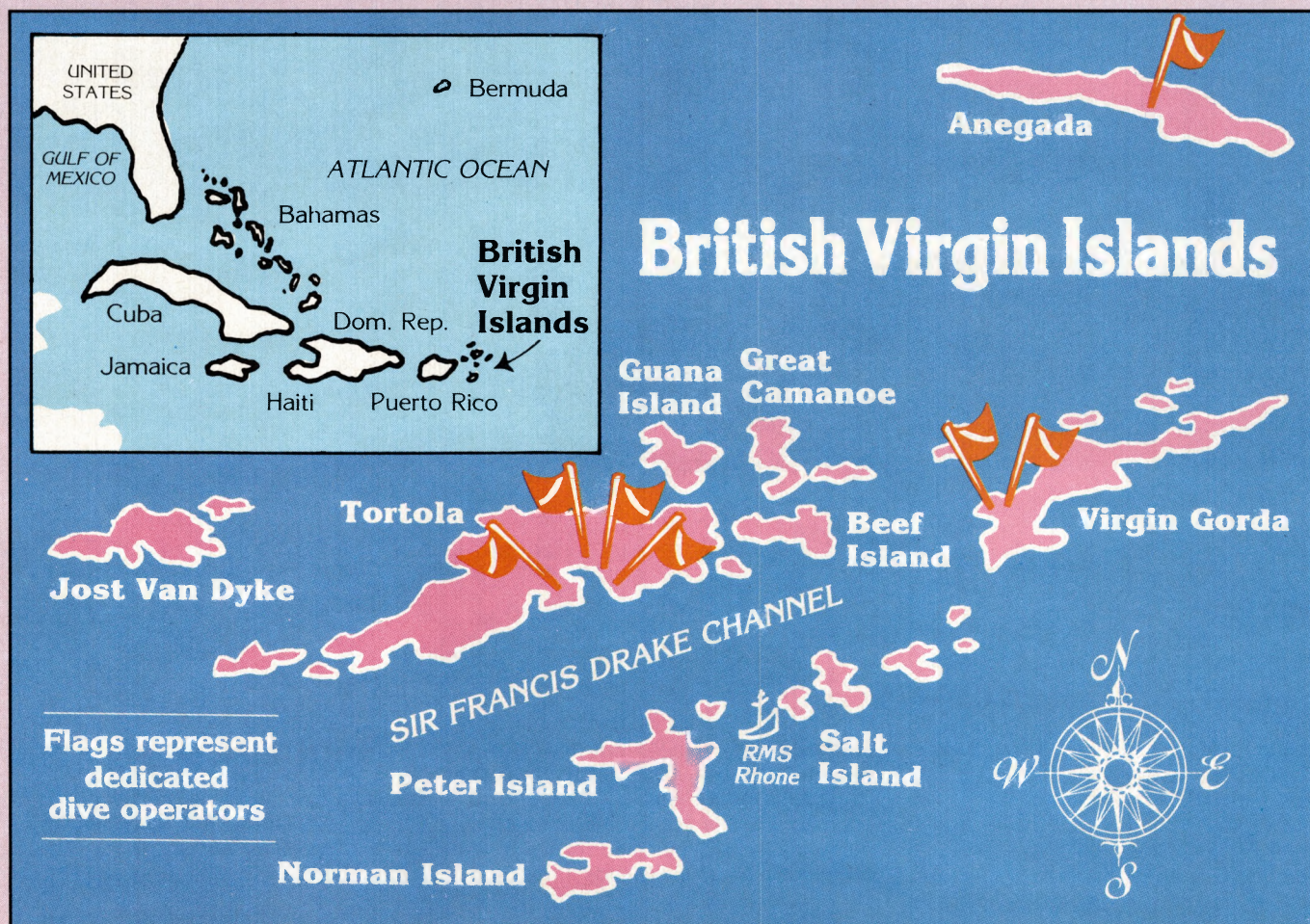
ry. Here you will find excellent restaurants, boutiques and island shops, banks, administration buildings, the hospital and Government House. Famous as a hunting ground during buccaneering days, Beef Island is the site of the 3,600 foot international airport.

Virgin Gorda is the second largest island and likewise has the second largest population. Named by Columbus, Virgin Gorda is a favorite stopover for both yachtsmen and landlubbers.

The northern half of Virgin Gorda is mountainous, rising to a peak of almost 1,370 feet. The southern half of the island, near Spanish Town, is almost flat, with giant granite boulders appearing like tossed marbles from some giant's game. This area is called the The Baths. The Baths of Virgin Gorda are unique granite rock formations with dimly-lit ethereal sea caves. Some of the most beautiful beaches are found among these large boulders. Excellent snorkeling can be found in and around the partly submerged rocks.

There is also an abandoned Copper Mine on the southeast tip of Virgin Gorda. Old sugar cane mills hidden among the scrub and foliage are found throughout the island. Some old mills have been turned into hotels, with restaurants fashioned out of the great houses. Other ruins are still being discovered.

Other islands that have fascinating



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THE BRITISH VIRGINS

points of interest include: Salt Island, with its two large salt evaporation ponds, used during the Dutch settlement days to extract salt for food preservation; Norman Island, with three large caves and tales of buried treasure; Peter Island, the location of the exclusive Peter Island Hotel and Yacht Harbour, a true-life Fantasy Island; mountainous Jost Van Dyke, location for famed Foxy's Nightclub and the birthplace of Dr. John Lettsome, founder of the British Medical Society; and Anegada, which can barely be seen on the horizon, the graveyard for hundreds of wrecked ships.

The reasons for coming to the BVI are as varied as the islands themselves. However, most of the vacationers who turn their sights southward to the British Virgin Islands come for one reason—the sea. And, whether you come to scuba dive or snorkel, sail the blue waters or just contemplate the sea from the sunny shores, getting to the BVI is painless.



Airlines such as Pan Am fly direct to St. Thomas. From St. Thomas you can catch a short scenic ferry ride to Tortola. Or, fly wide body jets to San Juan, Puerto Rico and make easy connections aboard a smaller island hopper plane to Beef Island. No matter which method of transportation you choose, air or sea, you will find entrance into this island nation quick and efficient.

Customs and immigration are simple and fast. Entry into the BVI requires a valid passport, but for U.S. or Canadian citizens, a voter's registration card or birth certificate is acceptable. Travelers may also wish to note that English is the spoken language, the U.S. dollar is commonly accepted and the electric service is 110 volts, 60 cycles. Taxis are readily available and there are several dependable car rental agencies.

The air temperature in the BVI is most compatible with casual attire. Winter months usually record a temperature of about 77 to 85°F, while summer boasts a balmy 80 to 90°F. Water temperatures vary only slightly. In the winter months they may be as low as 74°F, while summer water temperatures reach a high of

85°. Underwater visibility often exceeds 100 feet.

Constant trade winds keep the humidity temperate, hence the effect of the tropical sun is reduced. A word of caution, however: Because the temperatures are so comfortable, added sun protection is a necessity.

Diving services in the British Virgin Islands are most complete and quite flexible. Whether you choose a land based dive resort, join a live-aboard dive vessel, charter a bareboat or crewed yacht or just kick back and enjoy the scenic anchorages, secluded beaches and involve yourself in West Indian culture, you'll know you have truly found paradise.

LAND BASED DIVE RESORTS

If you prefer to check into a hotel for a land base of operations with daily dive tours, the BVI has plenty of options. There are 37 hotels and 35 guest houses throughout the islands that range from economy to luxury. However, only a few of the hotels have structured dive/lodging packages. A few of these properties include the Prospect Reef Hotel, Long Bay Hotel, FRENCHMAN'S CAY RESORT, the Sugar Mill Hotel, Treasure Isle Hotel and the exclusive Peter Island Yacht Club. BASKIN IN THE SUN, the BVI's only Five Star PADI Training Facility, provides service to all of these hotels.

Owners Alan Baskin and Eva Cope are long time dive operators—formerly of Baskin In The Sun in Haiti for nine years, three years in the Dominican Republic and three years in Grenada—who know that perfect formula for offering the dive trip of a lifetime.

Baskin In The Sun has two retail facilities—a main dive store at the Prospect Reef Hotel and another store at the Long Bay Beach Resort dock. The center at the Prospect Reef Hotel is devoted to T-shirts, leisure wear, post cards, snorkel and scuba gear sales and rentals. In addition, there are dive gear storage lockers, a freshwater rinse and the fleet of dive boats docked only a few steps away. Additionally, Baskin In The Sun offers a pickup/drop-off facility for guests staying at the Treasure Isle Hotel. However, you will never need to pick up a tank, wash your own equipment or worry about lugging your equipment back and forth from the dive center to the hotel. Baskin's dive crew will gladly rinse, store and set up your gear for the next day.

Baskin's fleet includes two large wide bodied dive boats, the 30 foot *Apache* and the 36 foot *Tejas*. The newest addition is the 55 foot day dive boat, *Narcosis Too*. Typically, the smaller boats will run to the more popular BVI dive sites, while the larger *Narcosis Too* will make extended day trips to some of the more remote dive sites—offering live-aboard style diving, with the comfort of sleeping in your hotel room at night.

The PROSPECT REEF HOTEL is a large 131 unit complex sprawled over 14 acres of ironshore. The hotel offers 79 suites that include kitchen facilities, the other rooms are in a variety of configurations. In addition to diving facilities, Prospect Reef Hotel offers its guests six tennis courts, three pools, charter sailboats, motorboats and sportfishing charters. A very watersports oriented resort, there are also conference facilities, gift and grocery shops and even a hair salon.

TREASURE ISLE HOTEL is on a scenic bluff overlooking Road Town Harbour. It is hidden from the roadside by lush clusters of coconut palms, banana and mango trees and tastefully landscaped with frangipani and ginger thomas. The 40 comfortable rooms feature either double or king sized beds. Each room has cable TV and most overlook the freshwater swimming pool, which has large underwater viewing ports. There is a pool-side bar and giftshop as well as a happy hour lounge directly above where local calypso bands play. Adjacent to the pool is the restaurant, which features American and native cuisine.

LONG BAY HOTEL is a beautiful hillside estate of more than 50 magnificently landscaped acres that slope toward Tortola's most sensuous beach. The resort

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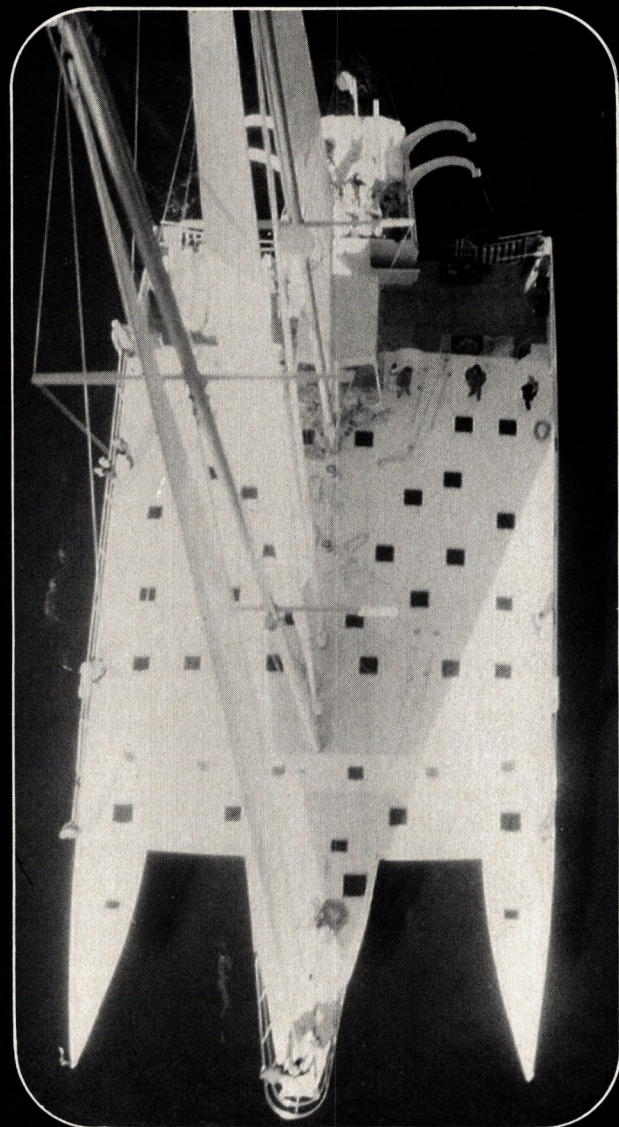
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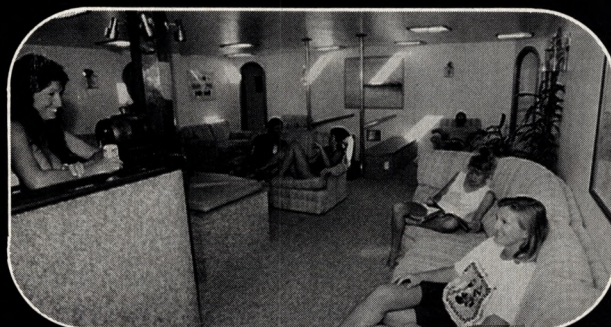
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PETER ISLAND YACHT CLUB is an exclusive island retreat with more than 1,800 acres of green hills, sugary beaches, shady palm trees and fragrant oleander. The hotel offers an incredible variety of post dive activities, with 52 rooms ingeniously designed to direct every swirl of sea breeze through them.

BLUE WATER DIVERS, owned and operated by Mike and Keith Royle, is at the Nanny Cay Marine Center. It offers dive packages with the new 40 room **NANNY CAY RAMADA HOTEL**. Its two boats, the *Blue Runner* and the catamaran *Cat Blue*, run to all the popular sites off Tortola and specialize in rendezvous diving. **ISLAND DIVERS LTD.**, in downtown Road Town, also offers dive trips, rental gear, snorkeling and scuba equipment sales.

UNDERWATER SAFARIS, at the **MOORINGS MARINER INN** on Road Town Harbour, is perhaps one of the largest dive facilities in the British Virgin Islands, offering dive packages with several hotels including the Treasure Isle. Owned and operated by Bob and Gail Stafford, it provides dive trips for both the hotel guests and charter boat clientele. The Moorings Mariner Inn is a West Indian style hotel and marina complex that offers a combination of 38 double rooms, each with kitchenette facilities. Half of the rooms feature covered patios, the others have balconies. Other features include a freshwater swimming pool and a tennis court as well as an extensive marina and an incredible fleet of sailboats.

The full service scuba facility is right on the Moorings pier. The nautical decor dive center offers a fine selection of T-shirts, island attire, scuba and snorkel rentals as well as retail sales. Underwater Safaris maintains an impressive dive fleet. Only steps from the dive center is the 42 foot *Mako*, the 26 foot *Underwater Safaris I* and the 30 foot island hopper *Rendezvous II*. Each vessel is equipped with tank racks, walk-through transom, large extended ladders and dry storage for photo equipment.

In addition to packages with the Moorings Mariner Inn, Underwater Safaris offers several hotel/dive packages with accommodations at a variety of inexpensive to luxury resorts. Underwater Safaris has a satellite dive center at the beautiful **MARINA CAY RESORT**, a private island with

12 Mediterranean style villas on a six acre site. A magnificent barrier reef surrounds the island, offering excellent snorkeling opportunities.

HOTEL CASTLE MARIA is an economy hotel that has clean, air-conditioned, harbor view rooms with kitchenettes.

THE SUGAR MILL INN is a fine example of island antiquity. It was formerly a 16th century sugar cane plantation and owners Jeff and Jinx Morgan have turned the old stone house into a fascinating hotel. There are 18 deluxe and two standard suites that overlook the grounds. Much of the historical ruins remain—the restaurant was constructed from the remains of the stone house. A freshwater swimming pool has replaced the old ox-turned grinding wheels but the old vats, where rum was distilled, remain a showpiece.

Among the specialty services available on Tortola are those that cater to the underwater photographer. **RAINBOW VISIONS** is a full video and photo rental facility. At the Prospect Reef Resort, adjacent to Baskin In The Sun, owners Jim and Odile Scheiner specialize in E-6 processing, Nikonos and video rentals. There are three day underwater photo courses available as well as a unique video package to film your dive vacation. In addition to video service for Baskin In The Sun, Rainbow Visions services Dive BVI and the Trimarine Boat Company. Mauricio Handler, owner of **NAUTILUS UNDERWATER PRODUCTIONS**, located within the complex of Underwater Safaris, also rents underwater video cameras and produces custom underwater videos. **CARIBBEAN IMAGES**, under the direction of David Mansfield, processes E-6 film, rents and sells underwater cameras and accessories, teaches photography and produces custom videos.

DIVE BVI, at the Virgin Gorda Yacht Harbor, is owned by Joe Giacinto and operated by Kendell and Cindy Shewmake. Dive BVI operates a full service dive facility and boutique that features island fashions, T-shirts and a full complement of beach and sun wear. The dive center offers full certification and resort courses including PADI specialty programs and offers a complete line of dive gear rentals and scuba sales. The Shewmake's operate two large dive boats—the 38 foot *Delta Sea Wasp* and the 35 foot *Bruno Stillmann Sea Cat*. A satellite dive center at Leverick Bay allows for an additional dive site itinerary.

Dive BVI offers several different packages with a variety of hotels on Virgin Gorda. **LITTLE DIX BAY** is part of Rockresorts International and generally caters to an upscale market or those who enjoy being pampered. Little Dix Bay is on a crescent shaped sand beach with more than 500 acres of perfectly manicured mountain slopes. The hotel offers guests a total get-away vacation with seven tennis courts, horseback riding, private beach trips and deluxe accommodations

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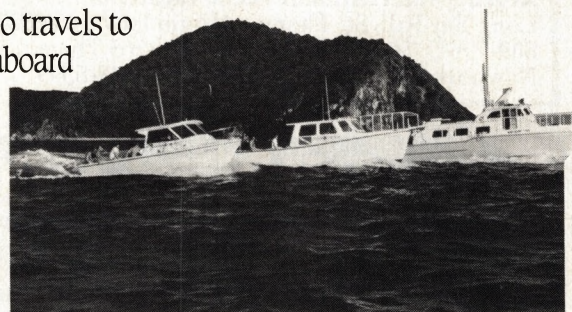


“We're Alan Baskin and Eva Cope. Since 1969 we've been operating a dive company based on a very simple idea: Show our guests the best dive vacation possible. We must be doing it right because so many of you keep coming back. Last year we celebrated our 30,000th diver! • What makes Baskin In The Sun different from other dive destinations? Well, for starters, you won't have to lift a finger to carry tanks or even wash your own gear. Once you drop off your gear bag at the

shop, loading the boat and daily wash-ups are on us. You didn't take a vacation to work, so just relax and concentrate on the diving. • Every day our boats take you to spectacular dive sites — the best of the British Virgins and some of the best in the world. Pinacles, coral gardens, walls and even the renowned Wreck of the Rhone. We show our guests a variety of sites and accommodate all skill levels.

Variety is where the newest ship in the Baskin fleet comes in: the 55 foot, all aluminum Narcosis Too. It cruises at 20 knots so we're able to go much further. Each day is a different adventure. The Narcosis Too travels to outer islands and distant wrecks — spots that used to require a live-aboard boat. We give you the chance to experience the quality of live-aboard diving, but still have the comfort and privacy of a hotel room at night. • And speaking of hotels, Baskin In The Sun has selected six of Tortola's finest so you have a choice, from economical comfort to world class luxury. We can match your budget with the right hotel and answer almost any question because when you call our toll free number you'll be speaking to our office in Tortola, right beside the dive shop. • Call us to learn about the best of the British Virgins. We'll be happy to send you complete information and even happier to meet you.”

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Dive BVI also services the BITTER END YACHT CLUB, along the north shore of Virgin Gorda. Other equally fine hotel/dive packages can be arranged by booking through Dive BVI with resorts such as: GUAVABERRY SPRING BAY, MAN-

GO BAY BEACH RESORT, DIAMOND BEACH RESORT, FISHERS COVE RESORT, OLDE YARD INN and the economy bookings with OCEANVIEW HOTEL.

LIVE-ABOARD DIVE BOATS

While many of the best BVI dive sites are close to operators in Tortola and Virgin Gorda, others remain hidden among the smaller islands and cays. One of the best ways to explore these enchanted British isles is to sail among them. The British Virgin Islands offer the visiting diver the largest diversity of live-aboard dive boats found anywhere in the Caribbean.

There are crewed boats and bareboats, cruisers and sailers, luxury yachts and cruise ships, day boats and sailers. All live-aboard dive boats invite individual bookings, some small sailing yachts cater to private charter groups.

The M/Y *CORAL STAR* is a classic looking luxury dive ship. In operation for just more than one year, this elegant lady dispels the myth that all live-aboard dive boats are military in type. From her smooth, straight bow to her rounded champagne glass-style stern, she is a first class dive vessel, owned by Herb Lambrechts and his partner Tom Conlin.

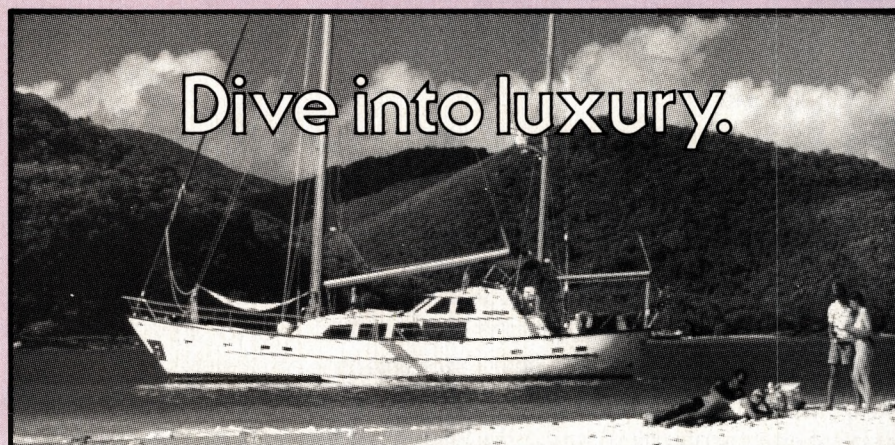
The overall length of this gleaming white and teak trimmed vessel is 115 feet and she has a beam of 22 feet. Once aboard, you cannot help but be awe inspired by the rich wood paneling, oak parquet tables and the comfortable sofas in the main saloon.

The *Coral Star* has eight staterooms, each with ample storage and closet space. Two master staterooms on the main deck feature queen sized beds and private bath and shower. Six additional staterooms on the cabin deck have double berths, an overhead Pullman bed and vanity with dressing mirrors. Each has semi-private bath with hand laid tiles and highly polished fixtures. A special feature of the *Coral Star* is the stereo system and color television in each of the staterooms (with VCR and complete video library).

From the main saloon, a spiral staircase leads to the ship's library, which supports an impressive collection of reading material. From the upper deck you can walk past the classic brass and teak wheelhouse to an observation deck, or back toward the stern where the open-air wetbar is the gathering place for evening festivities. The top deck is the fully carpeted sundeck, with comfortable chaise lounges and wind screening.

Typically, the *Coral Star* begins its week long dive excursions after departing Road Town on Tortola. Your vacation plans will call for two days in the British Virgin Islands, diving some of the more famous sites, before making an overnight passage to the storybook island of Saba in the Netherland Antilles. Here you will spend several days diving the undersea pinnacles of **Saba Bank**, then make a return trip to the BVI to wind down around the scenic Baths of Virgin Gorda. Several trips are planned this year. Some include trips to the Bahamas with well known photographers and filmmakers.

The narrow waterway between the islands, called the Sir Francis Drake Passage, is one area of the world where million dollar yachts parade constantly. Most never receive more than a quick glance, because yachts are as common in the Drake Passage as automobiles are on the interstate. But, when the largest trimaran in the world cruises through the islands, heads turn, people stare and most wonder what it would be like to cruise the



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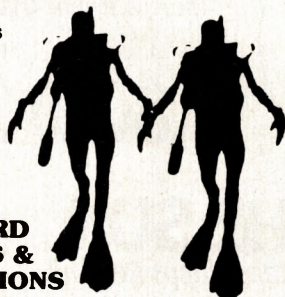
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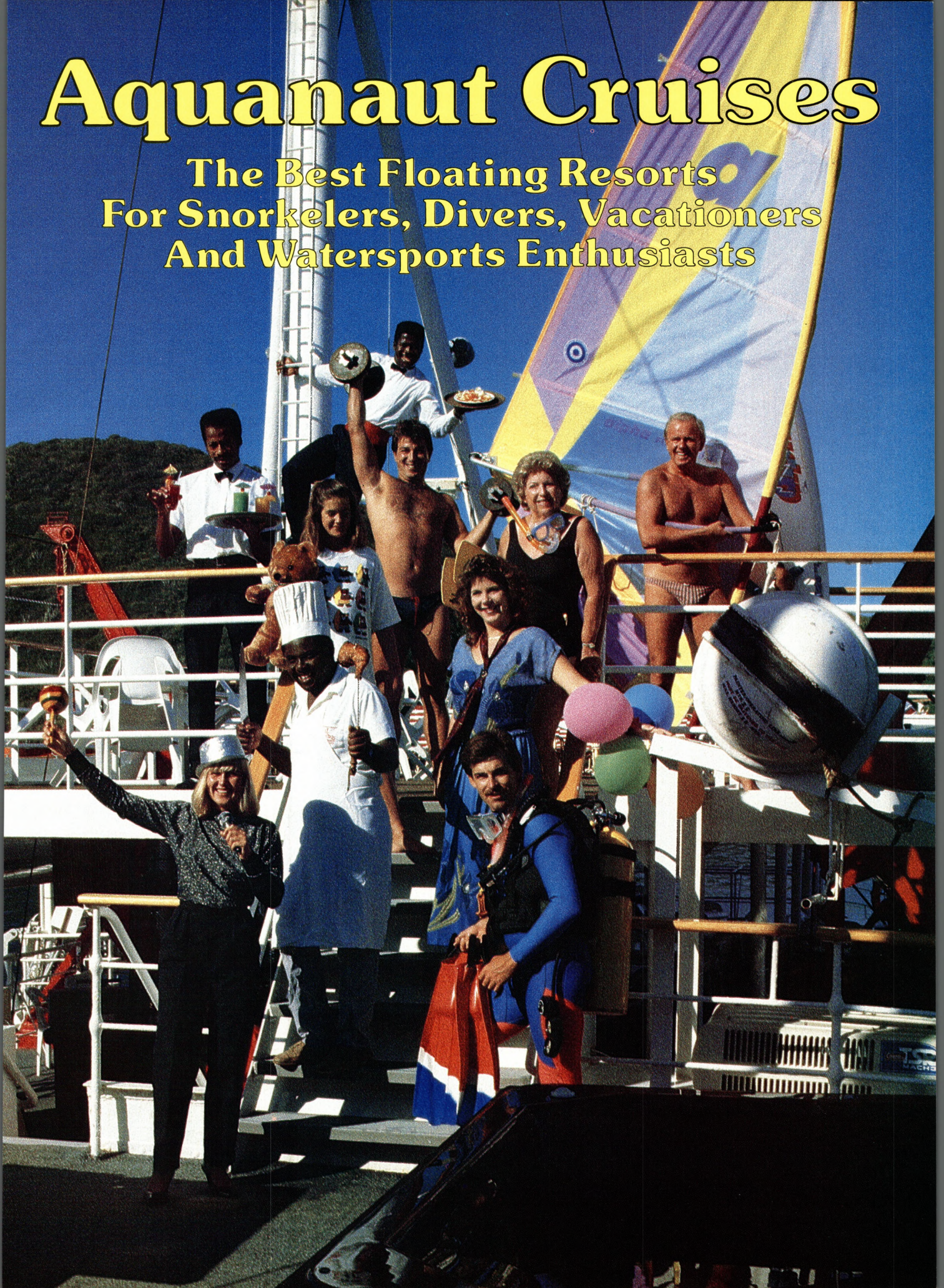
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Each of the 20 outside staterooms are air-conditioned, have direct-dial telephones and private bathrooms with showers. And every cabin has a picture window, porthole or sliding glass doors with private balconies.



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An AQUANAUT CRUISE VACATION will be the best you've ever had, whether you are one who simply likes to try something different, a diver, windsurfer or you just want to get started and get certified.

Most meals are served in the comfort of the cool outdoor dining rooms, with an ever-changing backdrop of beaches, coves and tropical islands. There are also tastefully decorated inside dining rooms for business meetings, seminars, parties or other special events.

The style, atmosphere and camaraderie is one of the big AQUANAUT CRUISE LINE'S sellers. Our ships are a dream for beginners. Get certified in one week and still enjoy the fun cruise for little more than it costs to just get certified at home. The well balanced "unlimited dive program" coaches from beginners to experts. Needless to say the dive sites are an underwater photographer's paradise.

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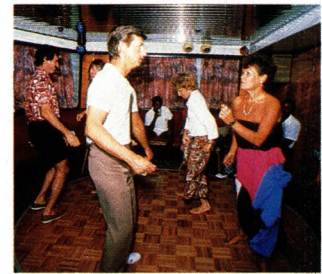
Unlimited diving is encouraged, provided the standard procedures of no-decompression diving are adhered to. All tanks & weight belts are provided, and diving from the HOLIDAY is the easiest you will ever experience. All you do is walk on-to one of the dive boats, and each custom boat goes to a different dive area so you will never be crowded.



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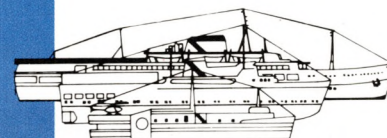
dining rooms on tables set with china and crystal. The spacious cabins are all air-conditioned with telephones,

twin or queen size beds, private bath, picture windows or sliding glass doors and balconies.



The M/S AQUANAUT HOLIDAY soars four decks above the water, is 200 feet long and 40 feet wide. Completely rebuilt in 1988, the HOLIDAY can accommodate 80 passengers in its 16 outside staterooms, including the Holiday Suite which features its own queen-size bed, private bathroom, living room with sofa bed, mini-refrigerator, TV/VCR and its own private balcony.

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The large indoor dining room can serve all passengers in one sitting. All cabins are air-conditioned and have private baths, phones and piped-in music.

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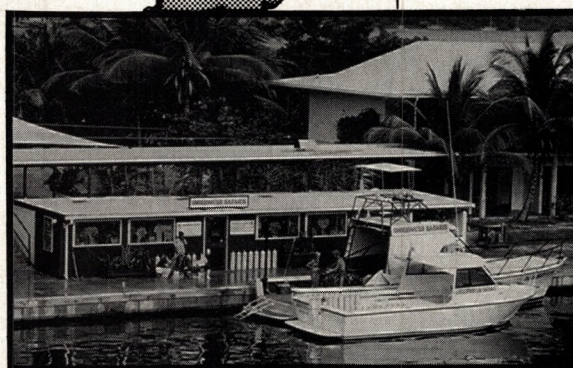
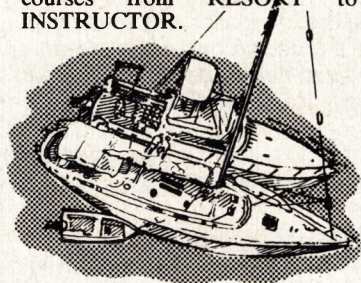
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THE BRITISH VIRGINS

isles under 5,200 square feet of sail. The *CUAN LAW* (pronounced Q-ann, Gaelic for "ocean") is an all new aluminum trimaran, 105 feet long and 44 feet wide, with masts 103 feet tall.

The *Cuan Law* is part of the Trimarine Fleet owned and operated by Duncan and Annie Muirhead, who also operate the popular trimarans *Lammer Law* and *Misty Law*. The *Cuan Law*'s saloon is large and handsomely decorated. It is the center of the social activity and features comfortable lounging. The ten staterooms are situated around the perimeter of the saloon—each with private heads and showers, ample storage beneath the beds, with additional closets and shelves. The vessel is fully air-conditioned, however, each of the cabins is uniquely designed with ports and hatches to allow the cool prevailing trade winds to ventilate them while offering the breathtaking sights of the BVI.

To the stern of the saloon is a spacious outdoor dining area covered by an awning, with individual dive gear storage

lockers and an on deck air fill station. One of the interesting features of this large sail/cruiser is the aft video and projection room. A private room with theater seating for 20 is equipped with large screen television and VCR, a complete video library and slide projector.

The *LAMMER LAW* is only slightly smaller than its sister ship. With an overall length of 93 feet and a beam of 42 feet, the *Lammer Law* remains one of the finest live-aboard dive vessels in the Caribbean. Configured similar to the *Cuan Law*, the *Lammer Law* has eight staterooms that border the comfortable main deck. This is where you will find the lounging saloon. Each of the staterooms features private head and bath. Each of the cabins can be arranged as a twin or double, allowing maximum flexibility among guests.

The *MISTY LAW* is the smallest of the three trimarans, with a length of 56 feet. *Misty Law* accommodates up to eight

guests with the same high standards as her larger sister ships.

The watersports equipment for the three large trimarans includes full scuba gear, twin compressors, windsurfers, fishing tackle and two stable inflatable tenders that double as waterski boats. One of the most attractive features of the Trimarine fleet is the large shaded cockpit decks that serve as both sundecks and activities centers. Standard cruises through the Virgin Islands include seven day excursions with special arrangements for sailing down-island to the Windwards and Leewards.

The largest and most spacious member of the BVI dive fleet is the new 200 foot M/S *AQUANAUT HOLIDAY*. The *Holiday* is the sister of the very popular *Aquanaut Explorer*, which first introduced cruise ship style diving to the BVI. This concept has proved very popular in the islands, hence owner/operators Gary Hytha and Eric Heindl designed and built the larger *Holiday* with the same high quality service in mind. The slightly smaller *Explorer* is now operating weekly cruise/dives to Bonaire and Curacao.

When you first see the *Holiday*, its most impressive features are the top deck balconies and glass sliding doors. Resembling a *Holiday Inn* with a rudder, the huge vessel is the largest diving cruise ship in the Western Hemisphere. Each of the air-conditioned staterooms features full private bath, ample storage space and extra closet and shelf space. Each of the cabins has either queen or twin full sized beds. The upper deck cabins feature sliding glass doors that open to a balcony, while the lower deck cabins have large, four foot viewing ports perfectly suited for an incredible view of the emerald isles.

The *Holiday* features a huge outdoor dining room covered by a sunroof, where typical American meals are served with an island flair. The sunroof serves as the post dive relaxation area and also as a helicopter landing pad. Special arrangements can be made for a breathtaking aerial reconnaissance flight.

A fully stocked wet bar is on the stern deck, adjacent to the sports room. Here you will find a selection of free and universal weights, two spas and an aerobics center. There is a host of other activities aboard the ship that will keep you entertained. These include a variety of video movies and books, windsurfing, beach outings—and there is always the casino and disco for late night owls.

The newest of the BVI live-aboard dive fleet is the newly refurbished *TROPIC BIRD*. It has been in operation for more than ten years and has become an institution among the BVI. Owned and operated by the American Travel Leisure Corporation, which also operates the very popular *La Strega* in Belize, the 110 foot *Tropic Bird* has undergone a \$250,000 renovation and facilities redesign. The new

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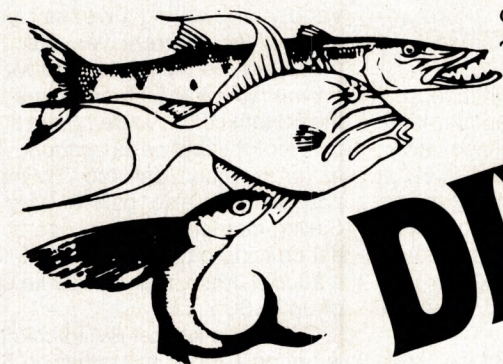
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Set up ideally for both groups and individuals, Leverick Bay offers the highest quality accommodations at very reasonable prices. Week long packages start as low as \$690.00 plus tax and gratuity, per person dbl. occ. Packages include: eight days seven nights deluxe accommodations, three meals daily, five days diving, two dives per day, all equipment necessary. For more info. contact Dive B.V.I. or Leverick Bay Resort:

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THE BRITISH VIRGINS

Tropic Bird now has all the comfort and luxury features of the most up to date live-aboards of the world.

Known affectionately as the *Bird*, the vessel is fully air-conditioned and can accommodate 16 to 24 passengers in 12 double staterooms. The cabins have twin, double or queen sized beds with private baths. The main deck is where you will find the lounging saloon with wet bar and video entertainment center. The aft deck serves as both the outdoor dining and dive staging area. The top deck is where you will find the sun worshippers.

The new management has instituted some important changes. The *Tropic Bird's* all inclusive "no surprises" pricing policy means one price covers everything! There is also a selection of underwater photo and video equipment rentals as well as an E-6 processing lab on board. The newly expanded itinerary includes the same "unlimited diving" policy that made the *Bird* famous. Additionally, there will be many more dive sites available, more island side trips and extra

activities such as windsurfing, beach-combing and island cruising.

CHARTER AND BAREBOAT YACHTING

If live-aboard diving is your thing, but you prefer to be your own captain, there are several alternatives to cruise/diving in the BVI. THREE BUOYS COMPANY, at Nanny Cay, offers a new concept in live-aboard diving. It has 52 foot houseboats that sleep six, are fully air-conditioned and feature full galley and hottub. The houseboats come equipped for a full week of diving activities.

NORTH/SOUTH CHARTERS on Virgin Gorda offers a variety of different sailing vessels, both crewed and bareboat. There are 44 C & C sailboats ranging

from 35 to 48 feet in length.

VIRGIN ISLAND SAILING LTD. offers a variety of exciting dive/sail packages aboard 38 different vessels. Some of these include the luxury 65 foot trimaran *Promenade*, the 50 foot trimaran *Encore*, the 63 foot ketch *Golden Skye* and the 74 foot motor yacht *La Buscadora*. The *Ppalu* (pronounced pah loo, Polynesian for navigator) is also part of Virgin Island Sailing charters. *Ppalu* is one of the largest cruising catamarans. At 75 feet, with a 28 foot beam, she is capable of speeds of up to 30 knots.

One of the largest BVI yacht charterers is not on Tortola, but rather on St. Thomas. REGENCY YACHT CHARTERS offers both power and sail vessels as well as crewed and bareboat charters.

As you may have already surmised, the quality and potential of BVI chartering is most impressive. Other charter groups include CARIBBEAN SAILING YACHTS, STEVENS YACHTS and the BITTER END YACHT CLUB.

BVI DIVE SITES

Yachters may find the special allure of the BVI to be the rugged beauty of the verdant mountain islands and languid bays, but divers will marvel at the equally impressive mirror images found around the idyllic undersea carpet of corals. Given the islands' grand mountains, natural deepwater coves and the fact there is always a leeward side to be dived, the BVI has a lot of underwater versatility for even the most fastidious undersea adventurer. Just place your order! There are caves and caverns, coral gardens and sponge topped pinnacles, sloping walls and massive schools of fish, tiny marine creatures and large oceanics, historical shipwreck tragedies and modern intentional wrecks.

Of all of the BVI dive sites, and in particular the shipwrecks, the *Rhone* is the most famous. I have visited the wreck of the *Rhone* many times and still find her fascinating. Today, after more than 122 years on the seafloor off Salt Island, the *Rhone* is both a museum and a marine sanctuary. The 150 foot bow section, complete with bowsprit and foremast, rests on its starboard side in 80 feet of water and is remarkably intact. Inside, thousands of fish have taken up residence where passengers once slept and dined. A large jewfish affectionately named Abraham calls the *Rhone* home.

In less than 25 feet of water the huge rudder and propeller lie among the debris of the broken aft section. The wreckage remains a testament to the tragic ending of this once proud British Royal Mail Steamer. Sunk in 1867, the *Rhone* was lost with all hands when a violent hurricane slammed her onto the rocks with crushing force. Today, these same rocks are home to schools of red squirrelfish, grunts, spotted coney and groupers.

A short swim from the wreckage is



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Rhone Reef. It begins as shallow as the breaking surge on the towering rocks above and reaches to a depth of more than 40 feet. There are three caves that are only a dozen or so feet apart and are filled with glassy-eyed copper sweepers. A large rocky sand flat, protected by smooth volcanic rocks, provides an interesting dive. The breaking surge on the rocks above is fascinating to watch and equally interesting to photograph.

Blonde Rocks is an exciting pinnacle dive. In the center of the channel between Deadchest and Salt Island, the rocks are often awash at low tide. The depth ranges between 15 and 60 feet with coral ledges, tunnels, caves and overhangs. Atop this prominent spire, a yellowish fire coral gives the site its name.

Dry Rocks East is another rocky outcropping of volcanic slabs that protrude above the surface at low tide. The depths range from a few feet to more than 85. While the shallow, protected rocks provide an excellent dive, the most action can be found off the deeper edges of the pinnacle where the current tends to get a little stronger. Here, I have observed schools of spadefish, horse-eye jacks, turtles and nurse sharks.

Spyglass Reef is one of my favorite dive sites. Near Peter Island, it is a wall that slopes from about 15 feet to more than 60. It is covered with long necked

purple tube sponges and lots of tropical reef fish. The sand flats at the base of the reef provide the opportunity to see large southern stingrays.

Alice in Wonderland is another excellent location for photo buffs. Large mushroom-like coral formations give this site its name.

The Indians make up a popular site for novice divers and/or snorkelers. Four tall rocky pinnacles rise more than 25 feet from the water and form the feather-like appendages of a "ceremonial head-dress." A shallow lagoon with small elk-horn corals is in the protected leeside of the pinnacles. This is an excellent night dive with small macro critters showing their brilliant colors. These are easily photographed with extension tubes and frames. **Painted Walls** is a dazzling profusion of colored corals and sponges. There are three long canyons, a cave, a tunnel and depths that range to 40 feet.

Some sites often visited by the live-aboard dive boats include the **Chimney** on the west side of Great Dog. Named for its resemblance to formations used by mountain climbers, Chimney has a series of submarine arches and canyons with colorful sponges and many varieties of juvenile reef fish. **The Baths** at Virgin Gorda is one of my most favorite photo locations in the world. The large boulders are an aesthetic wonder. Nearby, the

Aquarium is an unusual place with a large family of tropical fish. **The Blind-ers**, only a few hundred yards seaward, is notable for its color coated boulders.

The **Chikuzen** is an exciting wreck dive of more modern vintage. A former Korean refrigerator ship, it caught fire off St. Maarten and drifted ablaze toward the BVI before finally coming to rest about eight miles north of Great Camanoe. The ship lies on its port side in 75 feet of water and is home to an impressive array of marine life. This natural disaster has become a perfect refuge for marine life. In its short life on the bottom (since 1981) the ship has attracted a resident jewfish, easily approachable stingrays, eagle rays, schools of amberjack and African pompano, schooling reef fish and cruising sharks.

The British Virgin Islands offer a treasure trove of things to see and places to go beyond the sea and its shores. Historical sites and scenes of natural beauty are abundant throughout the islands. Exploring by car or by foot, by boat or underwater, these islands can be both fun and relaxing. For more information on the dive sites, dive packages and hotel lodging, contact any of the dive operators in our sidebars or contact the BVI Tourist Board at 370 Lexington Avenue, Suite 412, New York, New York 10017; or call (800) 835-8530—in New York (212) 696-0400. 🐠

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SKIN DIVER'S TRAVEL TIPS

When Should You Go?

TEXT AND PHOTOGRAPHY BY GERI MURPHY

Live-aboards may be less crowded during the off season and sometimes the price will be less.



The most wonderful aspect of dive travel is you can do it on a year-round basis: Tropical dive resorts and live-aboards do not have freezing spells and blizzards. There is always someplace in the world where the sun is shining, the water temperature is 82°F and the U/W visibility is at least 100 feet. This is the reason why dive travel has doubled in the last five years!

One of the questions most often asked by new dive travelers is "When should I go?" Choice of travel time is often a dilemma for the beginning traveler who fears encountering bad weather or poor diving conditions. Yet weather is only one of the major considerations in planning a dive trip. There are five basic factors that affect your choice:

CRITERIA FOR PLANNING A DIVE TRIP

1. The most convenient time for you
2. Airline seat availability
3. Hotel or live-aboard availability
4. Seasonal pricing
5. Seasonal weather conditions

If taken in the above order, the decision becomes a simple process of elimination.

Most Convenient Time: The first and most important factor in planning your dive trip is your personal time availability. This is determined by your job responsibilities and family relationships. Many people have only certain time frames during which they can vacation. In such

cases, work dictates when you go. A tax accountant is not likely to take a dive trip during the first two weeks of April. Divers who wish to travel with their families must consider school vacations. And, if the spouse works also, the planning becomes even more complex.

A clue to when divers are most likely to travel can be found in SKIN DIVER's 1989 Subscriber Survey. One of the questions asked concerned when readers take their dive trips. These figures do not necessarily indicate the best dive travel seasons, but rather when divers have the time to travel:

DIVER TRAVEL OVERSEAS

Winter.....	47.5%
Summer.....	45.8%
Spring.....	38.5%
Fall.....	32.0%

The figures add up to more than 100 percent because many people take two or more dive vacation trips at different times of the year.

Dive trip activity is pretty well spread out over the entire year, with the heaviest activity in the summer and winter. While there may be seasonal fluctuations at some destinations, the worldwide picture indicates good diving is available somewhere in the world on just about every day of the year.

Airline Seat Availability: The availability of airline seats can be a critical fac-

tor in planning your dive vacation. Many resort islands have limited flights and therefore limited passenger capacity. More remote islands have only three or four flights per week because of limited number of aircraft.

There are also peak holiday periods such as Christmas and Easter when flights are booked solid. Other difficult periods are school holidays, back to school traffic, Memorial Day, July 4 and Labor Day weekends. If you are planning a dive trip on a major holiday, plan on making your airline reservations as much as a year in advance.

You should check the availability of airline seats before you get too far along on your vacation planning. Call the airlines' reservations desks and make inquiries. You may also wish to consult your personal travel agent or a dive specialty travel agent who is an expert in this field. If there are no seats available on the day you wish to fly, inquire about availability one or two days prior or after the preferred date. Try to keep your dates flexible to accommodate such adjustments.

If all the flights are full, inquire as to whether another airline has flights to your selected destination. If all the direct flights are full, inquire about indirect connecting flights. For example, the direct nonstop ALM flight from Miami to Bonaire might be full, but you can still get there by flying to Curacao and then connecting with a commuter flight from Curacao to Bonaire.

Hotel/Live-Aboard Availability: The availability of guest accommodations is just as important as the airline seats. And, the same basic rules often apply. Popular dive resorts are often booked solid during major holidays and during the peak diving season (if there is one). The best way to get around this problem is to plan your dive trip as far in advance as possible. This includes paying a deposit to confirm your accommodations.

Accommodations on a live-aboard dive boat can be more difficult to obtain than those of a resort hotel. This is because live-aboards have an extremely limited number of guest cabins and departure dates. The best advice is plan ahead. Experienced dive travelers will often make their live-aboard reservations 6 to 12 months in advance.

What happens if the hotel or live-aboard you desire is booked solid during the period you can travel? You can do one of two things: You can request to be

(Continued on Page 120)

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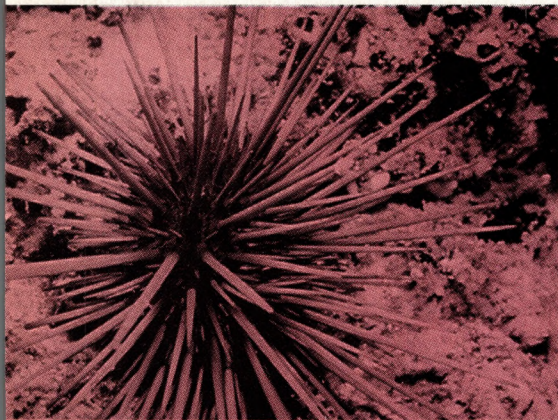
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photo/Bonnie J. Cardone

THE UBIQUITOUS URCHIN

Sea Porcupines Are Easy Prey And Super Palate Pleasers

BY MAVIS A. HILL

SEA URCHIN SPREAD OR DIP

Place roe sacs in a blender. Mix a second or two to liquefy. To use as a spread, add soft butter—a little at a time—until of desired consistency. Add minced onion or garlic, garlic salt, minced chives, olives or whatever else appeals to you—it's all good! Mix a few seconds more and use on toast triangles or crackers.

To use as a dip, substitute sour cream or cream cheese for the butter.

Far left: Sea urchins are plentiful in almost any ocean where seaweed, reefs and rocks are found. It's easy to see why they have been called "sea porcupines."

The sea urchin: a proud sunburst of spines, necessary to the ocean's ecology along with all other marine life, yet a menace to kelp beds (and sometimes, the diver). Dubbed "sea eggs" and "sea porcupines" in some parts of the world, sea urchins are colorful little pincushion-like animals that are plentiful in almost any ocean where seaweed, reefs and rocks are found. America is well supplied with sea urchins and all species are edible, with the exception of a few in the South Pacific and only during these urchins' reproductive periods.

It is paradoxical that Europeans envy

us not only our extensive supply of urchins, but the species available to us here in North America. The most delicious and the largest of all species is our own *Strongylocentrotus franciscanus*, a large urchin with a large name found off our own shores in mass abundance. The *S. franciscanus* are the reddish-brown and dark purple sea urchins whose tests (shells) alone often exceed five inches and may even reach a diameter of seven. The common purple sea urchin, *Strongylocentrotus purpuratus*, is most numerous on the Pacific Coast. These are about two inches across and may reach four

inches, depending on age.

In Japan, sea urchin roe is an expensive and sought-after delicacy. Seafood cafes in Italy and France serve sea urchin in the late fall months. (It is called *oursin* in France and *ricci di mare* in Italy.)

The sea urchin's name came partly from the Greek *cher* for porcupine. Like porcupines they are covered with sharp, needle-like movable spines that are constantly "feeling" surrounding seawater in search of food the animal can trap and transfer to its mouth, which is at the bottom of its globular test or shell.

The sea urchin is an ecological ma-



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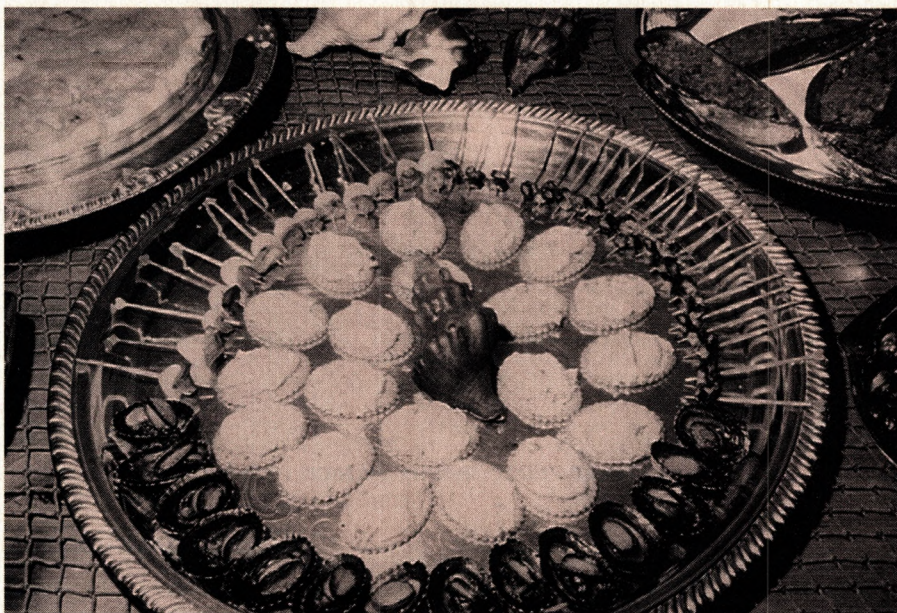
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photo/Paul J. Hill

Above: An elegant platter of crackers and urchin roe spread, encircled by limpets. Sea urchin roe is an expensive and sought-after delicacy in both Europe and Japan.

rauder, a pilferer of marine plants, slowly stalking and feeding upon algae, seaweed and kelp holdfasts. But, urchins provide food for fish and other marine life, especially the sea otter, which seems to prefer urchins.

The nice thing about sea urchins is the number of delicious recipes they lend themselves to, plus the fact you don't have to chase them, spear them or even search for them! They're simply there,

hydrogen peroxide directly to the wounds to cleanse them.

The sport of catching sea urchins is about as thrilling as picking roses, the only real challenge is plucking them without getting wounded. Your equipment is merely a prying tool to efficiently dislodge or lift the urchin from the surface upon which it sits. Urchins are able to remain in place as a result of little suction cups on their tube feet, which are also their mode of transportation. Movement is almost indiscernible, but the animals can and do move—in a surprisingly short period—from one area to another.

There's no limit on sea urchins and the entire contents of their tests are edible.

BOILED URCHIN

Boil whole urchins in salted water for about five minutes over a low fire. Remove from water and cut out the mouth with scissors. Drain entrails, leaving yellow or orange roe. Dip pieces of buttered bread or toast into the roe around the inside of the shell. (In Marseilles, urchins are enjoyed raw this way, so if you're not squeamish, skip the boiling!)

SEA URCHIN APPETIZERS

Separate each roe sac. Some remove the membrane from each sac. To do this, cut the sides of the membrane to separate top from bottom and peel off. Place each on a cracker and sprinkle with a little garlic salt, if preferred.

usually in plentiful supply, scattered alone or in groups.

Sea urchin spines are very sharp and generally don't allow even a wetsuit to deter their progress through to your skin, as most divers discover early in their underwater hobbies. Divers are hardly initiated into the world of scuba diving until they've been exposed to at least one or two good jabs from this creature's means of defense.

When you do come in contact with the urchin's sharp spines, it results in a painful puncture wound that may leave the tip of the spines embedded in your epidermis. These should be removed as soon as possible with a pair of tweezers, in much the same way as you'd remove a splinter. Apply a ten percent solution of

Europeans may sip the innards right from the shell. However, most people prefer to partake of just the roe, the five oval egg sacs nestled in a star shape against the inside curve of the test. The roe is fullest and most flavorful during the urchin's reproductive season. It is a yellowish-gray in the male, a bright orange in the female. The female's is considered the better flavored of the two.

CLEANING/PREPARING ROE

Sea urchins will stay alive for several hours if kept cool and should not be

(Continued on Page 123)

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LA STREGA

From a cobalt sea, the island rises in a series of great green humps accented by rows of cohune and coconut palms. To the west is the rusted hulk of a wrecked freighter. To the east, a small cluster of wooden houses is suspended on stilts over coastal waters. Across the sea the dim silhouette of mountain peaks identifies the coast of Honduras, 35 miles away. The shrieks and squawks of seabirds and parrots pierce the heated atmosphere. Our dive boat points toward the entrance to Brick Bay, nearly obscured by a thick mangrove jungle. Once inside the bay, the primitive scenery gives way to the architecture of a handsome resort and yacht club. With casual elegance and with access to miles of wilderness wall diving, Romeo's Resort, on the south side of Roatan, offers a first class diving adventure.

Roatan, a small verdant island in the western Caribbean, has arrived on the popular dive travel scene. With its lush jungle interior, emerald hillsides, secluded beaches crowded with spindly palms and surrounding turquoise sea, it appears as a tropical fantasy. The underwater vista, only one-quarter to one-half mile offshore, is another kind of tropical vision. The corals are robust and close hugging; a fringing reef, occasionally broken by a slim entrance to a bay or harbor, provides nearly 30 miles of continuous wall diving on both sides of the island. Dramatic drop-offs, awesome tunnels and huge canyons abound. A cast of thousands of marine creatures, so numerous no one yet has been able to determine a complete catalogue, populates these complex reefs.

If Roatan is not yet mentioned in the same sentence as Bonaire, the Bahamas, the Caymans or Cozumel, it is because of limitations in accessibility and the number of accommodations available. Until recently, only DC-3 prop planes could be flown to Roatan by way of the Central American mainland and less than 100 hotel rooms were available. Today, Roatan is relatively easy to reach through several U.S. gateway cities. Tan Sahsa, the Honduran national airline, flies 737s to the pleasant city of San Pedro Sula, where passengers transfer to another 737 jet for a short, 20 minute flight to Roatan. Existing hotels are expanding and others are currently under construction.

Still unspoiled and uncommercial, Roatan is also including paved roads, better transportation and better communications to its infrastructure. A recent addition is the handsome Romeo's. Location is the first blessing: Romeo's is the closest resort to the new 4,700 yard jet airstrip and the little capital town of Coxen's Hole. After arrival, the resort is reached via a 10 minute trip in the resort van.

After driving through a few miles of nearly untouched wilderness, arrival at a country club style retreat is totally unex-

ROMEO'S RESORT

**A DIVER'S
DELIGHT
ON ROATAN'S
SOUTH COAST**

TEXT AND PHOTOGRAPHY BY RICK FREHSEE

pected. Formerly a handsome yacht club, the new Romeo's Resort is even more beautiful. The main building, with 20 nicely furnished rooms, parallels the dock-lined waterfront. In the center, a peaked wooden roof shades a contemporary all-fresco restaurant and bar. The handsome dining room presents a pleasant island mood complete with details befitting a fine restaurant. Above the dining area is a cozy loft with a library and audio/visual center. Below is a full service dive shop, a handsome boutique and gift shop and the "animal den," complete with green parrots and two friendly spider monkeys constantly harassed by a Doberman puppy named Mr. John. At the dock is the 37 foot *Miss Leilani*, a well equipped single diesel custom dive boat. A second mid-sized vessel is under construction and an inflatable is also available.

Expertise in running a resort comes naturally to the robust and ribald Romeo Silvestri from French Harbor, Roatan. Romeo and his lovely wife, Connie, have entered the diving scene with considerable talent and energy. Everyone on Roatan knows about the good food and service of Romeo's Restaurant in French Harbor. Romeo is the supreme host, toastmaster and ambassador of good will. Running Romeo's Resort, it would seem, is the job he was born to do. Supportive and angelic, Connie Silvestri is a pretty lady who glows with the aura of a second beauty within. Both are enthusiastic divers and normally spend long hours at the resort.

Dive operations, food service and hotel staff all follow Romeo and Connie's mandate of unusually good service. From excellent food, highlighted with both continental cuisine and seafood specialties, to unusually good tropical drinks and a variety of Latin and island festivities and celebrations, this is a place that is truly special. The ambiance at the pool bar is stunning. A beautiful, spacious freshwater pool is bordered by the hotel and pool

bar and surrounded by tropical foliage. The pool bar and grill features drinks, *fajitas* and snacks under rosy sunsets and starry night skies. It's an upscale version of a safari lodge in the wilderness.

Romeo's is very accessible to a rich diving environment. It is the closest resort to the famed dive site, Mary's Place, and to many coastal miles of nearly unlimited and superb wall diving.

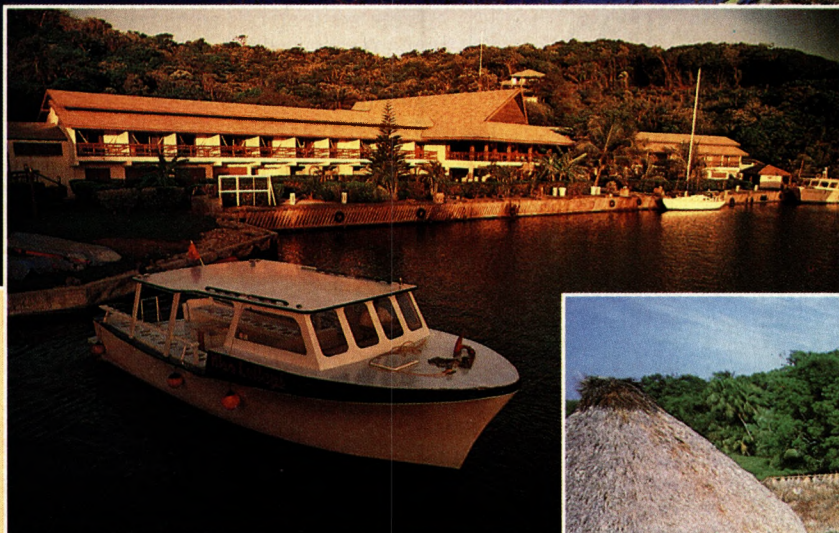
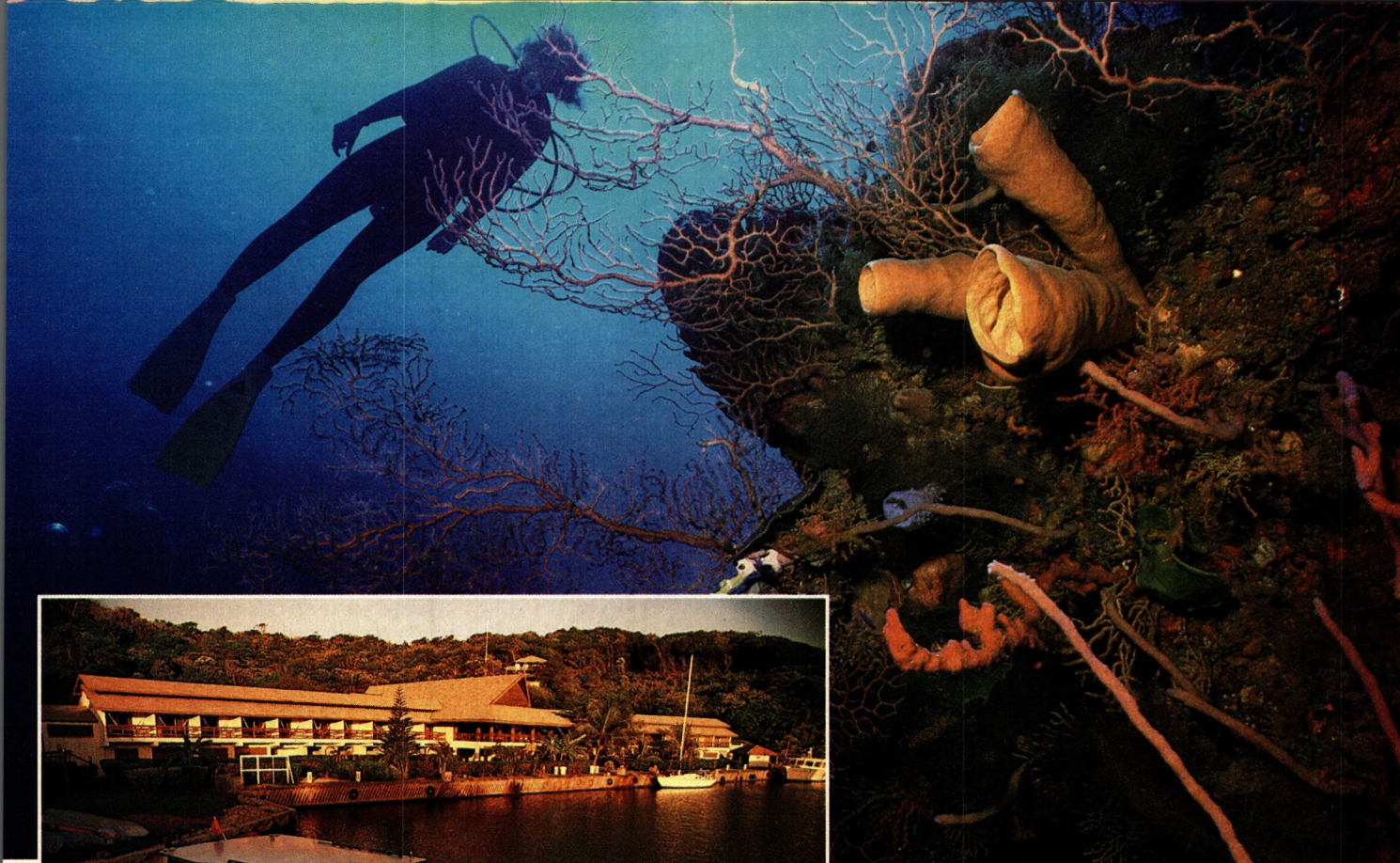
Normally, two, single tank boat dives are offered each day and there is one night boat dive per week. Although shore night diving is available in the mangrove-lined lagoon, the best shore diving is during the day from the resort's private island a short distance from the hotel



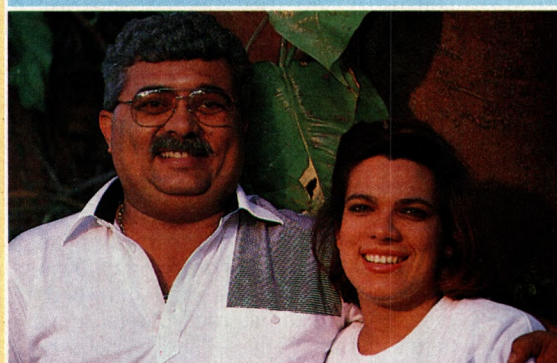
Tan Sahsa flies 737s to San Pedro Sula. There passengers transfer to another 737 for the 20 minute flight to Roatan.

grounds. Although boat dive sites begin only three minutes from the resort, Romeo's has access to more than 30 special sites and many barely known diving areas along 30 miles of coastline. What distinguishes Roatan reefs is their intricate, complex structure. Underwater sites offer incredible variety with a network of fissures, crevices, tunnels, peaks, ledges and overhangs, even in shallow water. Other unusual attractions are the great stands of pillar corals, rare in most parts of the Caribbean.

The **Enchanted Forest** refers to a wide area of rolling reefs, ledges and
(Continued on next page)



Top: Dramatic colors and topography on the wall off Roatan's south coast. A fringing reef, occasionally broken by a slim entrance to a bay or harbor, provides nearly 30 miles of continuous wall diving on both sides of the island. **Above:** The main building of Romeo's Resort parallels the dock. **Right:** The freshwater pool at Romeo's Resort is bordered by the hotel and a bar and surrounded by tropical foliage.

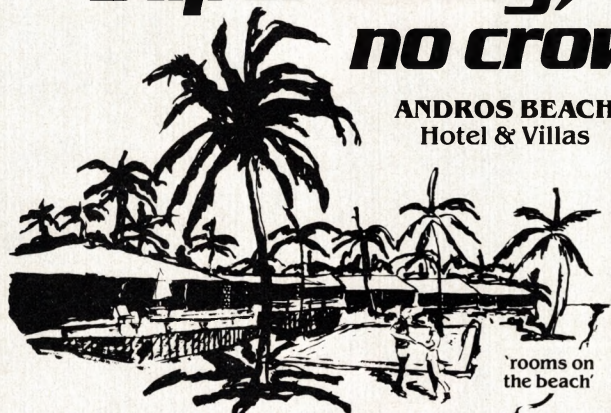


Above: Romeo and Connie Silvestri are dedicated to providing their guests with good service. **Right:** Pillar coral at Connie's Place.



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ROMEO'S RESORT

drop-offs along an offshore bank a couple miles west of Romeo's. The area is a fairyland of marine life and wall structures. Outside and farther offshore the fringing reef, the Forest is seldom visited by groups of divers and is quite wild and prolific. Romeo's Resort is currently the only dive operation visiting the area. The top of the reef begins in 55 to 60 feet of water with rolling hills of staghorn coral, pillar corals and seafans. Many reef fish, schooling fish and pelagics are normally sighted. Over the top of the reef, thousands of creole wrasse pass by in endless single file parades.

There are drop-offs along both sides of the bank. We swam for 20 minutes at 70 feet along the eastern edge, sighting—among a list of colorful subjects—pairs of huge queen angelfish, many large iridescent azure vase sponges and bouquets of black corals, crinoids, antler sponges, orange encrusting sponges and deep-water fans. At the offshore end of the reef, at about 80 feet, the corals plummeted vertically out of sight. Here both scenery and expectations of marine life reached a Bay Islands zenith. Beneath us was the Bartlett Trough, 6,000 feet deep!

Mary's Place is Roatan's signature dive. A short distance east of Brick Bay is a small sandy cay where Romeo's maintains a private beach. Offshore, along the close-hugging fringing reef in just 30 feet of water, is an immediate drop-off. Descending over the wall, at a site marked by a permanent boat mooring, you discover a yawning canyon. The canyon, as the theory goes, is a separation between the main wall and a huge chunk of it that has broken away and partially fallen down the sloping shelf. The outcrop, of Grand Canyon proportions, is bisected further by smaller fissures inviting exploratory side trips.

The usual dive plan is to enter the huge canyon at the western end and swim through at a depth of about 80 feet. Toward the eastern end, after a couple minutes of casual sightseeing, the canyon narrows to a single-file configuration. Here, divers can inspect the rolled and pleated formations of pillow lava lining the canyon walls. Years ago, when I first entered Mary's Place, the canyon was lined with black coral, deepwater fans and delicate tube sponges. Today, owing to the popularity of the site, some of the growth has disappeared. Careful movements inside Mary's Place will prevent further damage to this breathtaking site. During the winter months it is common to find schools of silvery minnows and parades of goggle-eyed jacks inside the canyon, elevating the experience.

Other premier dive sites often visited by Romeo's include **Calvin's Crack**,



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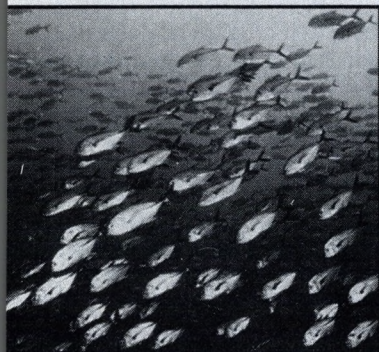
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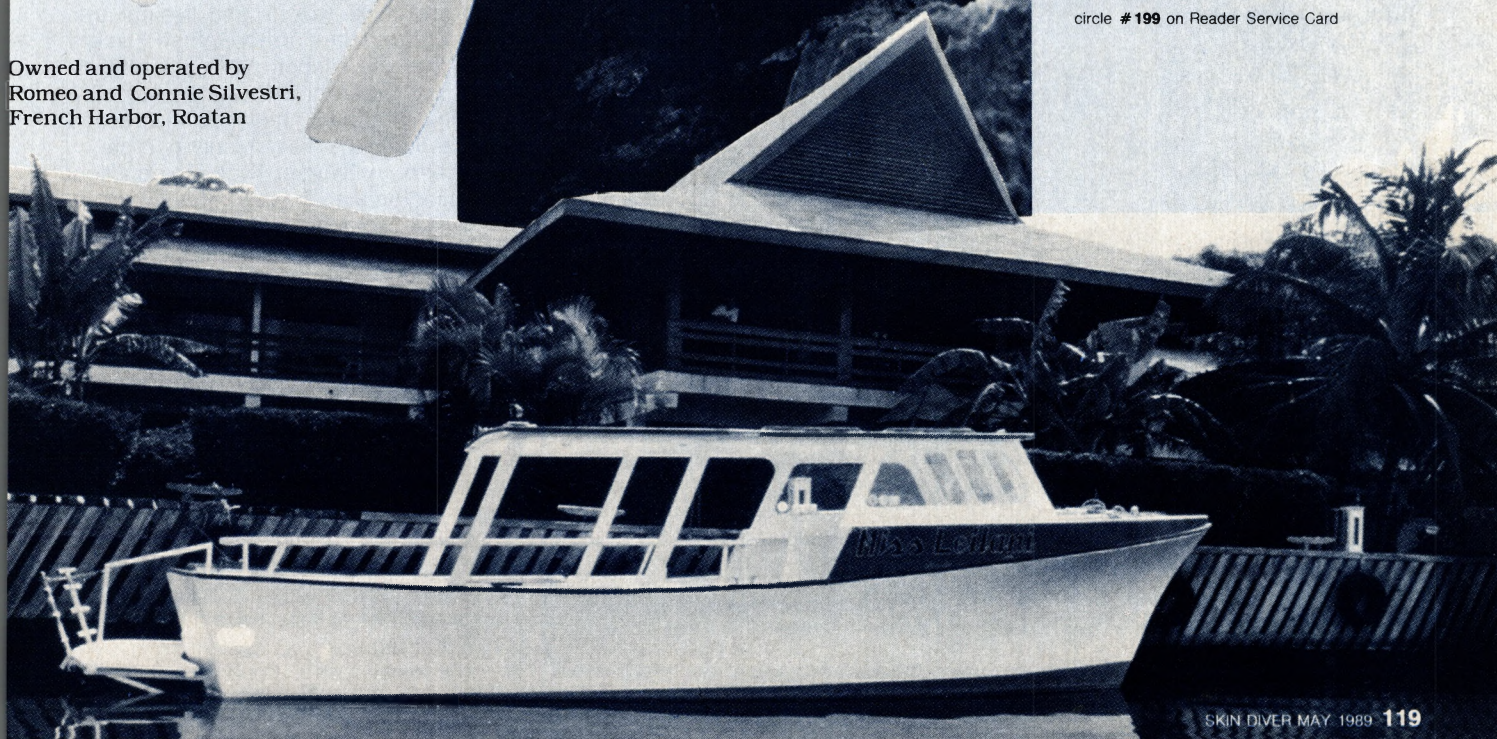


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ROMEO'S RESORT

another example of one of Roatan's dramatic fissures and the generally spectacular scenery at **Connie's Place, Carib Bight and Parrot Point.**

Topside activities at Romeo's revolve around small group or large scale island parties, often staged at the resort, and Roatan's natural attractions. A number of complimentary watersports are available, usually at the private island beach. Town tours into Coxen's Hole or French Harbor can always be arranged as can several kinds of island tours, including a sojourn to the black-Carib village of Punta Gorda.

Primary dive services, including full scuba rentals and instruction, are complete. Sea and Sea camera rentals are available. Romeo's will expand and develop ancillary services, such as photography and video, in the near future. The U.S. office has complete, up-to-date information on this already spectacular, up and coming western Caribbean dive resort. For information/reservations contact Jeanene Warren at Romeo's Resort's U.S. office: 2901 Northeast 23 Court, Pompano Beach, Florida 33062; (305) 942-6073 (local and fax) or (800) 535-DIVE (U.S. and Florida).

TRAVEL TIPS

(Continued from Page 112)

put on a stand-by list in case of a cancellation or you can shop for a hotel or live-aboard in a different destination. The latter is generally the wisest choice.

The dive travel industry is growing rapidly and more resorts and live-aboards are coming into the business every month. If you cannot obtain reservations at your first choice, start shopping around. There are many new resorts and live-aboards that have plenty of room.

Seasonal Pricing: If you are on a tight vacation budget, the cost of hotel rooms and dive packages may be of prime consideration. Should this be the case, be sure to check the seasonal pricing for the destination you intend to visit.

Most tropical resorts experience seasonal tourist traffic fluctuations and price their rooms accordingly. For example, the Caribbean winter season (December to April) is booked full and this is regarded as the high season. Rooms are priced at their highest rate—often 50 to 75 percent higher than in the low season.

Many resort islands have a high season, low season and shoulder seasons (halfway between high and low). Hotels on such islands may have three or four different rates.

The most recent trend is hotels and

dive operators getting together to offer special seasonal dive/hotel packages. These packages are often real bargains and certainly worth the trouble of changing your vacation dates.

Spring and fall are becoming increasingly more popular dive vacation periods in the Caribbean because of seasonal pricing. This is particularly true during the months of September and October. And, while the resort prices are at their lowest, the diving can be very good.

While winter has the lowest period of dive travel, it is still a substantial factor. During the winter, traveling divers will be paying high rates and competing with other tourists for airline seats, hotel rooms, etc. Still, many divers head for the sunny Caribbean or Pacific sands when their hometown is buried under six feet of snow and the thermometer reads minus zero. There is nothing like a winter dive vacation to rejuvenate the spirit.

Seasonal Weather Conditions: One of the most asked and least answered questions in dive travel is, "Which is the best month for diving this area?" Weather is the roulette wheel of dive travel—a totally unpredictable factor in your vacation planning. This is because most dive resort islands are in the world's tropical belt, which is notorious for unpredictable weather. There can be bright sunshine in the morning, pouring rain by lunch time and sun again in the afternoon. Storms can come out of nowhere and disappear a day later. To make things worse, weather patterns frequently change from year to year. There is no long term pattern.

It is because of this unpredictability that dive operators and travel agents are reluctant to recommend any period as having perfect weather. They don't want to be held responsible for freak storms. The good news is that most tropical resort islands experience acceptable diving weather 90 percent of the time. The odds are in your favor. 🐠

SCUBA ST. LUCIA

Scuba St. Lucia, in cooperation with Anse Chastanet Resort, is offering special dive group packages July through October. Offered in the package is seven night's accommodation in a superior room, 12 beach or boat dives (or night dive—substitute up to two day dives for night), breakfast, lunch and dinner, tax and service charge and roundtrip airport transfers. Dive group guests will also enjoy a welcome cocktail, mini-sailing and windsurfing, use of tennis court, snorkeling equipment, chaise lounges/beach towels and a complimentary basket of fruit with this package. A tour of old French Plantation is also included.

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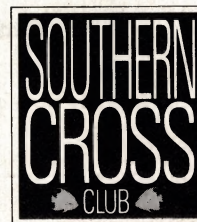
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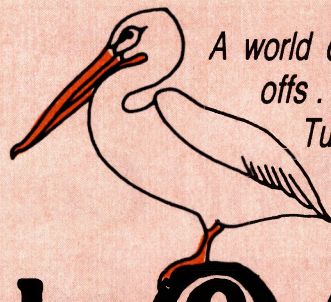
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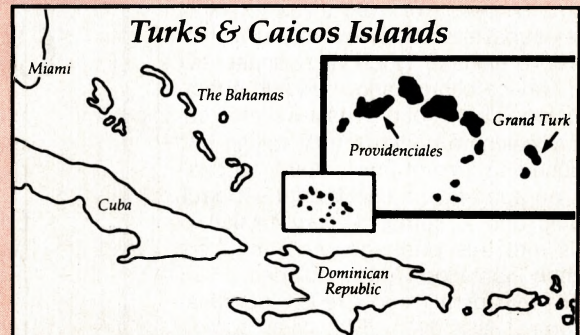
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UBIQUITOUS URCHIN

(Continued from Page 115)

used if they're not cleaned before they die. The cleaning is much better done outside on a patio or in the garage on papers—it's a big, wet mess.

You'll need a stout diver's knife or hammer to cut or break open the shell of the urchin and a spoon to carefully lift the roe sacs, plus a receptacle, such as a small bowl, in which to place the roe.

Use care in handling the urchin to prevent punctures to your skin. The preferred method of getting into the shell is to use a knife to cut sharply down each side of the test so it splits in half, spilling


URCHIN KELP/RICE ROLL

- 1/4 lb. raw fresh fish fillets
(bass, tuna, albacore)
- 2 scallops
- 6 large sea urchin egg sacs
- 1 package dried seaweed leaves
(nori, laver or porphyra)
- 1 C uncooked rice
- 1/2 C vinegar (rice vinegar preferred)
- 1 T sugar
- 1/2 tsp. salt

Cut fish and scallops into long, thin, 1/4 inch wide strips. Cook rice, then set aside for 15 minutes. Fluff and pour into a large, flat pan.

Dissolve salt and sugar in the vinegar, then sprinkle the mixture over the rice, fluffing the rice with a spoon as you pour, so the vinegar mixture will coat each grain—this keeps the rice from becoming sticky or mushy. Place a sheet of kelp on a folded paper towel or, preferably, Japanese style on a bamboo mat. Spread rice evenly over the kelp, leaving one-quarter inch margins on each side and an inch margin at each end.

Place the fish, scallops and urchin roe on the rice at the end where you will start the roll. Start as for a jelly roll, using the napkin or mat to form the roll. Moisten the last inch of the kelp with vinegar to make it stick and seal. Slice roll crosswise into four or six individual servings with a sharp knife. Serve this with teriyaki sauce or lemon juice.

the watery viscera in the process. You'll see this liquid contains a liberal amount of chewed up seaweed (it's what urchins live on and, as noted, some people drink this seaweed/seawater mixture, finding it tasty, as well as the roe itself). After cutting the test in half, remove the roe sacs with a spoon or your fingers. The other method of getting into the shell is to turn the urchin upside down so the opening is on top. Use your hammer to tap away pieces of the test in the center around the opening until enough of the shell is broken away to facilitate reaching in and removing the roe sacs. 

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DIVI FLAMINGO BEACH

(Continued from Page 78)

shirts or even barefoot. The physically disabled will appreciate the Flamingo Beach Resort's ramps and wheelchair adaptable hotel rooms. In fact, dive groups such as the Moray Wheels and Handicapped Scuba Association have honored the Flamingo Beach for its dedication to facilitating access throughout the property.

Service is an important commodity at Flamingo Beach and under the direction of resident manager Monte Hollander, every guest will be personally met at the airport and transferred to the hotel free of charge. Once ensconced in one of the spacious hotel rooms, most of which overlook either the Caribbean or one of the two swimming pools, all guest and diver services are readily accessible. Scuba enthusiasts will be pampered by the world's most complete dive service, Dive Bonaire. It consists of two dive centers, each located at one end of the waterfront (Dive I and Dive II). Each has its own pier to facilitate shore diving and dive boat docking, scuba equipment rental, secure guest gear storage area and retail center for T-shirts, books, post cards, dive accessories and a full line of gear (including masks, fins, BCs and regulators). Dive boats depart the docks at 9:00 am, 2:00 and 7:00 pm (for night dives) and unlimited shore diving is available 24 hours a day. This latter is a special benefit given the quality of **Calabas Reef**, just offshore Flamingo Beach.

Under the direction of resident dive operations manager Alan Jardine, eight boats now comprise the Dive Bonaire fleet. All of them are set up with diver convenience features such as tank racks, dive platforms with extended ladders and marine electronics. Four of the boats are 35 foot custom fiberglass V-hulls (*Sunrise*, *Sunset*, *Sunburst* and *Sunshine*), powered by either twin six cylinder diesels or a single V-8 diesel. Two of the boats feature 35 foot modified cathedral hulls (*Alice H* and *Joyce W*) powered by twin 8.2 liter Detroit diesels. The 31 foot V-hull *Images* and 34 foot tri-hull flattop *Falling Star* round out the fleet. The sunboats are well suited to extended day trips to the Washington/Slagbaai National Park and all of the boats are used in the charters to the reefs and wrecks of Bonaire and Klein Bonaire.

Additional infrastructure to facilitate diver convenience and service includes a huge air system (two 50 cfm compressors and one 65 cfm) with 90,000 cubic feet of air storage. This immense system pumps the 420 tanks presently in inventory, with plenty of cascade reserve to spare. Excellence in dive boats and hardware has become a trademark of Peter Hughes Dive Operations and Dive Bon-



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DIVI FLAMINGO BEACH

aire continues to uphold the standards.

Instruction is another major facet of the Dive Bonaire offerings. With educational programs including specialty courses (such as deep diver, night diver, drift diving, coral reef ecology, computer diver and underwater photography), open water checkouts and resort courses, open water certifications and even master scuba diver programs available, Dive Bonaire is the perfect place to learn scuba skills. One of the more popular courses is a one hour introduction to Zen diving, an advanced U/W technique whereby buoyancy is controlled to minimize effort, maximize bottom time and preserve the coral reef by reducing diver impact.

VACATION INSTRUCTOR

Flamingo Beach/Dive Bonaire will be hosting a special one week PADI Instructor Development Course for certified divers who wish to progress to the instructor level. This course, taught by Pro Dive, one of the foremost instructor training organizations in the U.S., will be offered the week of November 3.

Divers can now combine a week of Bonaire diving with the educational challenge of becoming an instructor.

For information on the PADI Instructor Development Course aspect of this week, please call Pro Dive at (800) 772-3483 or (305) 761-3413.

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A unique new aspect of the business is the Land and Sea photo center, which, until the recent move to expanded facilities, was housed in a separate building. Now all are on the same premises for additional convenience. Land and Sea offers C-41 film processing for color negatives and same day services for color prints, in addition to photo retail including duty free camera sales, especially for Nikonos and Nikon cameras.

The facilities of Dive Bonaire and Photo Bonaire are ideally suited to the needs of the underwater photographer. Both Jerry and Suzie are accomplished underwater

photographers and are able to communicate their knowledge effectively in a teaching scenario. There are classrooms, quick film processing, excellent shore diving not more than 50 yards from the Photo Bonaire counter and a dive staff especially well adapted to assisting the special needs of the underwater photographer. In testament to the facilities and professionalism of Photo Bonaire, Nikon has appointed the Flamingo Beach Resort and Casino a host property for the Great Nikonos Shootout on Bonaire and the ongoing Nikon School of Underwater Photography. For more information on either Nikon program, call (800) 272-9122.

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FLORIDA'S EAST COAST

TEXT AND PHOTOGRAPHY
BY MARK M. LAWRENCE

All dive destinations are the same, right? Wrong. Look at Florida's southeastern shore, known as the Treasure and Gold Coasts. This region is bathed in warm sub-tropical sunshine. (How else would they be able to grow all that delicious citrus?) There are dozens of different parks in the region where you can explore deserted beaches with sloping sand dunes capped with wispy wild sea oats that rustle in the ocean's breeze. You can disappear into the miles of unexploited wetlands dotted by isolated hummocks that harbor scores of exotic species of sub-tropical life. You may opt to paddle upcurrent on a meandering shallow river fringed with old cypress trees dripping with Spanish moss. Perhaps your idea of a park has wild rides, leaping dolphins and comical parrots. You can enjoy all of these options while staying in your choice of quaint roadside inns or full blown multi-million dollar five star resorts.

Food is a highly diversified art form in south Florida. If the area's finest restaurants and chic continental cuisine don't appeal to you, sample some the region's simpler specialties such as "gator" tail or key lime pie.

Fine, but why should a diver visit Florida's southeastern coast? Well, can you remember the last time you swam beside a 300 pound sea turtle? Has a dive guide ever shown you how to scratch an eight foot long slumbering nurse shark? Been wreck diving lately? Was your descent to the submerged hull highlighted by curtains of steely eyed barracuda, darting flights of yellowtail jacks and creole wrasse and, down closer to the ship, did your arrival scatter thick schools of striped grunts? Were the portholes, stairs and railings encased in a sheath of soft corals and hydroids?

Let's be honest. With the obvious exception of the sessile life

Guide To The Southland's Atlantic Shores



Florida's southeastern coast is bathed in sub-tropical sunshine and there are dozens of nature parks featuring scores of exotic species. Activities range from sporting events such as polo to theme parks to big city night life. The dive offerings run the gamut from ledges to shallow reefs to mini walls to wrecks, with the latter a specialty. Many ships have been purposely sunk in ideal locations to create artificial reefs. The marine life is plentiful and varied. Encounters with larger animals such as sea turtles, nurse sharks and moray eels are common. The dive operators offer both anchored and drift dives, depending on the current.

forms, no one can absolutely guarantee what motile marine fauna you will meet during your dive, but if you go out with one of the professional dive charter operations between Ft. Pierce and Miami, from Hutchinson Island to Key Biscayne, odds are good that you will have a great time underwater. All the excursions may start out the same, but off the southeast coast of Florida, anything can happen. After all, visiting divers have bumped into docile giants such as humpback and pilot whales. Dive teams have swum with sailfish, marlin and manta rays. Divers have been circled by inquisitive dolphins and amazed by bizarre giant ocean sunfish (*Mola mola*).

Southeast Florida dive operators offer either anchor or drift dives depending on the current. The specifics of the two techniques vary with the local conditions and the style of the professional dive operators. In the Jupiter/Juno area and around

West Palm Beach (where the Gulf Stream comes closest to the mainland) most operators drift. In the Stuart/Ft. Pierce and the Ft. Lauderdale/Miami territories, either technique may be used. Remember to always get a pre-dive briefing and when in doubt as to procedures and safety rules, ask your divemaster—professional divemasters want to help you have fun safely.

Many dive sites, including the artificial reefs, are known for their overall abundance of life. When a south Florida diver claims the bottom is obscured by incredibly dense clusters of schooling fish, believe him. The stars of the underwater show, however, are usually the larger marine animals—sea turtles, nurse sharks and green moray eels.

Southeastern Florida is rapidly emerging as the premier U.S. wreck diving center. Wrecks and other artificial reef structures benefit several groups besides divers, most notably the sport

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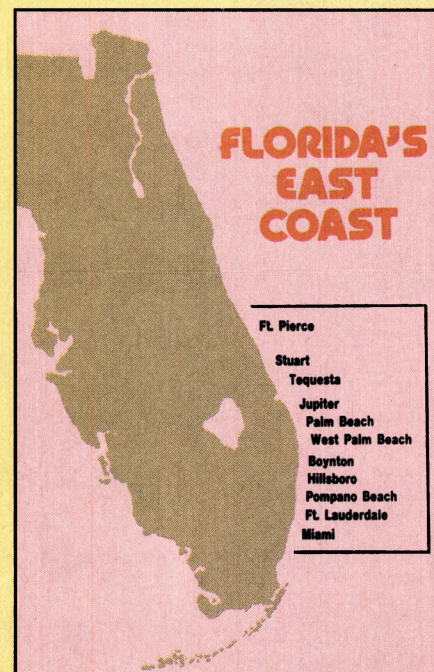


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and commercial fishing industries. Increasing the number of artificial reef sites that are accessible to sport divers and fishermen reduces the pressure on existing natural reef formations. The new reefs



quickly begin to function as biologically productive environments, helping to boost the local area's fish stock.

FT. PIERCE/STUART

The Ft. Pierce/Stuart area used to be described as sleepy and unnoticed. Cruising down the lazy Indian and St. Lucie Rivers toward the St. Lucie Inlet you pass thick woods and spacious homes. In the past few years this wild area has been rediscovered, but at a mercifully slow pace. Stuart may still have a small town atmosphere, but there is nothing small time about the diving just offshore. Two of the region's largest artificial reefs rest on the bottom here. Some of the oldest also lie beneath the sands near Ft. Pierce and Stuart.

Coins may still be found near the site of the **Paddlewheel Wreck**, approximately three miles south of the Indian River-St. Lucie County line. You will find the wreck in only 15 feet of water, about 50 yards offshore, but inside the first reef line. Since this used to be the site of the old inlet, ballast stones from many different ships lie scattered throughout the area. Look but do not touch anything in the Underwater Archaeological Preserve of the **Urca de Lima**. After slanted bars

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of silver were recovered from the *Urca de Lima*, the ship became known as the Wedge Wreck. This member of the famous 1715 Spanish fleet now lies in 10 to 15 feet of water.

Out in deeper water, the reefline, which drops from 55 to 65 feet, normally runs from north to south, but at the **Horse-shoe**, five miles offshore the Jaycee Park water tower, the ledge forms an east facing cup.

On January 21, 1989, the **USS Muliphen** became the newest addition to the artificial reef community. The 468 foot long steel transport rests on her starboard side, in 170 feet of water. Her port rail comes to within 90 feet of the surface. Because of the depths and the possibility of currents, this is definitely for experienced divers only.

Southwest of the *Muliphen* and 15 miles from the St. Lucie inlet rest two of Ft. Pierce's most famous World War II wrecks, the **Amazon** and the **Halsey**. Both were reportedly sunk by the German *U-133* submarine. They were sent to the bottom one night apart in May 1942. The *Amazon* lies in scattered pieces about 1.5 miles east of the *Halsey*. She has become known for her fish life and frequent sightings of large turtles.

When the 600 foot *Halsey* hit the sea-floor she came down in three sections. The stern is relatively upright and intact, a little ways south you fin over the inverted mid-section and, nearby, the right side up bow compartments. Although most of the wreck is less than 80 feet deep, one scour hole under the stern will put you down to 90.

Five miles to the south, the **Sirotkin Reef** contains the wrecks of the *Dreaga*, the *David T.* and the **USS Rankin**. The 459 foot *USS Rankin* is east of the St. Lucie inlet. Like her sister ship the *Muliphen*, the *Rankin* settled onto her starboard side. Her bow faces south. Although the ship ranges in depths from 60 to 130 feet, you can complete your tour without breaking 110 feet. Don't plan on trying to see the whole vessel on one dive, she's huge.

The 155 foot long hopper barge, *Dreaga*, and the 200 foot long LST, *David T.* are close enough that you can visit both on one dive. Look for spiny oysters on the *Dreaga* and search the sand flats at 80 feet for other exotic shells.

You can find good beach diving at **Bath Tub Reef**, north of the St. Lucie inlet. At low tide the first reef begins to isolate a long lagoon into what resembles a bathtub. Seawhips, seafans and fire coral cover much of the reef. **Bathtub Reef**

and **Peck's Lake Reef** to the south of the inlet shelter many species of juvenile tropicals. Peer under the ledge at Peck's to spot lobsters and nurse sharks.

Midway between the St. Lucie and Jupiter inlets runs **Loran Tower Reef**. It reaches to within 60 feet of the surface in some areas. Scout along the base of the sheer west face in 90 feet of water for lion's paws, hairy tritons and cowries. Big nurse sharks take advantage of the dark caves, some of which are deeper than ten feet, for mid-day naps.

JUPITER/JUNO

The homes lining the Intracoastal Waterway in the Jupiter/Juno area belong to members of America's elite. Many of the residents of Hobe Sound and Jupiter Island are the silent movers and shakers of our society. Others have been in the public eye as financial wizards, corporate giants or music and film stars. Most come to the area for its natural beauty and quiet life. The submarine world offshore the famous red Jupiter lighthouse may be full of natural beauty, but it is certainly not quiet. Like the reefs of the Ft. Pierce/Stuart area, the Jupiter/Juno reefs are primarily limestone ledges and ridges covered with a layer of sponges and corals. Depending on the season and the Gulf Stream, you may find 50 foot visibility and no movement or clarity of more than 100 feet with a current of two knots!

If you go for a winter dive at **The Pillars**, seven miles north of the Jupiter Inlet, watch for fat gray groupers among the caves. Red glass-eyed snappers hover above their holes throughout the year. The ledge drops from 65 to 80 feet.

Since the **Gulf Pride** sits in open sand flats only 30 feet deep, it's best to head for this wreck on a calm day. As you explore the bow section of this World War II vessel keep an eye out for snook and tarpon. Pelagics, normally found on deeper reefs, frequent the broken hull.

From the top of **Loggerhead Run** at 60 feet the reef drops in a series of westward steps to around 80 feet. A typical reef for this area, the craggy ledge is home to schools of grunts and snappers. Porkfish mill near the vertical face. Sand divers remain close to their burrows. If you head inshore approximately one-half mile to **The Tunnels**, also called **Twin Caves**, you'll encounter similar depths, 57 to 74 feet, but a ledge that drops in a single step. Stay near the reef face to spot the Twin Caves. The southern cavern is a wide passage. The slender second tunnel is big enough only for one diver to swim through at a time.

One of Jupiter's most famous reef systems, **Jupiter High Ledge**, lies south of the inlet. As with the reefs to the north, the ledge's west face is the most dramatic. The depths vary from 57 to 90 feet throughout this major reef system. The northern portion of the system is known as the **Rio Jobe Reef**. In places along

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the Rio Jobe section, the ledge falls in a sheer drop from 60 to 84 feet. Sponges cling to the hard surface. Packs of yellow jacks work the reef. Around **Scarface Lair**, the middle section of the ledge, the reef's profile changes from one with a single clean drop to a zone of rugged blocks cut from the main reef. The site

borrowed its name from one particularly fat eel that was used to getting handouts from divers.

Although the northern end of the Jupiter High Ledge may have more relief than the southern end, the latter section is more heavily dissected. This area, called the **Reformation** after the explorer Jonathan Dickinson's sailing barque, is usually a good place to look for hawksbill turtles and pairs of gray or French angels.

Farther to the south, six miles below Jupiter Inlet, spreads the **Juno Ball** reef. As with Jupiter High Ledge, Juno Ball runs north and south. Its western face stairsteps down from 55 to 90 feet. Be

sure to bring your camera. Loggerhead turtles and nurse sharks use the deep undercuts. Many caverns have schools of copper sweepers. Local divers have seen big gamefish such as sailfish in mid-water over Juno Ball.

THE PALM BEACHES

Palm Beach is a phenomenon. Ever since Henry Morrison Flagler started bringing his friends to the island in the '20s, Palm Beach has been the winter home for millionaires. These wealthy residents live a lifestyle that most of us plebeians only recognize from popular television shows.

It may be difficult to accurately establish a dollar value for Palm Beach millionaires' holdings, but it is even harder to estimate the priceless wealth of Palm Beach's submarine world. Although the Gulf Stream sweeps closest to Florida's coastline offshore the Palm Beaches, current strengths vary. Divers may fly down the 80 or 90 foot reefline at speeds in excess of one knot and then move into shallower sites where there is comparatively little current.

Outside of Palm Beach inlet are two popular artificial reef sites. The wrecks of the **Mizpah**, the **PC 1170** and the **Amaryllis** sit close enough so all three can be visited on one dive. For years the **Mizpah** was the star of Palm Beach's wrecks. The 185 foot long steel hulled ship, originally built as a pleasure yacht, was a patrol ship during World War II and then served a stint as a freighter. Jacks and snappers now roam the decks once walked by sailors. Her orderly engine room has become a maze of encrusted catwalks and silent engine blocks. Forced under the towering bow of the **Mizpah** lies the forward portion of the **PC 1170**. It looks as if the **Mizpah** rammed the smaller ship and the two sank, locked together. Actually, time and currents have moved the **PC 1170** under the **Mizpah's** bow. The **PC 1170** was added to the reef site long after the **Mizpah** and charges used to sink her split the 165 foot craft into two sections. The stern sits upright due east of the bow. Spiny oysters pump in the small dark chambers; groupers speed out from the hull when divers approach. If you float down current from the stern of the **PC 1170**, you will arrive at the bow of the **Amaryllis**. She has become a 440 foot long fishbowl. So many small-mouthed grunts collect here that you cannot see the bottom.

Palm Beach County has been adding new wrecks to the artificial reef site south of the inlet. Where else but Palm Beach would someone donate a fully functional **Rolls Royce** to the artificial reef program? Frankly speaking, at this point the paint job is shot. But, divers still like to have their pictures taken on the **Rolls Royce** and then go on to visit the more traditional wrecks of the **Eidsvåg** and the



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


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Barge. The ten foot relief of the Barge attracts fish such as hog snappers and groupers. Like the holds of the *Amaryllis*, the hull of the 150 foot *Eidsvag* carries a living cargo of schooling fish. When hungry bar jacks dive into the ship, grunts and snappers scatter for cover.

Like the reefs in the Jupiter and Ft. Lauderdale areas, the linear Palm Beach submarine ridges run north and south. The **Double Ledges** are probably West Palm Beach's best known major reef system. Along the miles of the Double Ledges, each dive operator has a different favorite pocket or other feature in the rocky reef. Average depths start around 75 feet on top with the first step dropping to 80 feet and the second step terminating in the sand at 90 feet. The outside, or as the local divers call it "the backside" of the reef slowly slopes on down to much deeper water.

South of the Double Ledges, **Breaker's Reef** starts as shallow as 47 feet and its west face drops ten feet. More soft corals such as Venus seafans and corky seafingers grow on this reef than on the deeper Double Ledges. Trumpetfish on Breaker's come in bright yellow, ultramarine and earthy copper colors. Some divers prefer to drift over the **Breaker's Fingers**, the hills and valleys of the Breaker's eastern face. Depths can exceed 85 feet on the fingers. Cones,

cowfish and other tropicals congregate in the narrow slit of the manmade **Trench**. The Trench slices perpendicularly across the top of Breaker's. Farther south, at **Paul's Reef**, the reef top comes within 45 feet of the surface. The **Horseshoe**, running east to west, sculpts a wide basin in the reef's plateau. Is there much fish life on these reefs? When you head back up the float line after diving either Paul's or the Horseshoe, look back down at the remaining divers. Each buddy team will be completely encircled by fish.

Three more wrecks spread out along Palm Beach County's shoreline are especially noteworthy. The 165 foot long freighter, the **Budweiser Bar**, originally named the *Olive M.*, was intentionally sunk in 90 feet of water in June 1987 and settled to the bottom approximately three miles south of the Boyton Inlet.

One of the county's favorite snorkeling sites is the **Delray Wreck**. Fin out from the southern end of the main public beach and in 18 feet of water you will spot the boilers, ribs and plates of the derelict. Juvenile spotted eagle rays sail over the open sand flats. Small Spanish lobsters hide inside the metal debris.

Broward and Palm Beach County teamed up to put the **Noula Express** on the seafloor close to the county line. The 114 foot Danish built freighter sits upright in a break of the third reef. Dive boats

from the Boyton and Hillsboro Inlets regularly visit the *Noula Express*.

FT. LAUDERDALE

What city has 300 canals and more than 165 miles of navigable waterways? Broward County's capital city, Ft. Lauderdale, proudly calls itself America's Venice. Marinas cater to the rich, their piers lined with private yachts ranging from 50 feet in length to multimillion dollar luxury vessels of more than 150 feet. The city looks out over the blue Straits of Florida to the east and ends in the wild Florida Everglades on the west. A major diving industry has grown up in the area over the last decade. Ft. Lauderdale is rapidly becoming a preferred travel destination.

Ft. Lauderdale has good shallow reefs such as the **Pompano Drop-off**. The east facing ledge is easy to find. Pompano Drop-off starts in 12 feet and drops to 32. Snappers abound.

The jagged ribs and metal plates of the **Copenhagen**, initially misidentified as the *Cumberland*, jut up into the shallow water from the edge of the ledge.

Farther south along the second major reef line, dive boats drift across three sites known as **HoJo's**, **Ro's Cove** and **Hall of Fame**. Starting in 18 feet of water the west facing drop-off plunges to 35. Copper sweepers stay in the short tunnel at the Hall of Fame.

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FLORIDA

South of the Port Everglades Inlet spread **Hammerhead Reef** and **Susan's Reef**. These two deeper reefs are part of the third reef system. From 45 or 50 feet the west face of the coral plateau drops an average of ten feet. As with the Breaker's Fingers, the outside of these Broward reefs is a series of alternating

hills and valleys.

If you really want to see fat hogfish, dive on **Hog Heaven**. This collection of barges sits on sand flats 72 feet deep. Beyond the barges, little else grows in the barren sand. Fish are naturally attracted to the artificial oasis.

Hogfish are also commonly spotted on the little 50 foot **Houseboat** that sits upright next to a patch reef in 90 feet of water. Deepwater gorgonians fill up the open windows and railings.

No discussion of Ft. Lauderdale's wrecks would be complete without mention of the famous **Mercedes I**. She's continually cited as the prime example of

what an abandoned ship can do for the environment and the diving industry. Since holes were blown in her bottom on March 30 1985, the lady has been the most requested site in Ft. Lauderdale.

Another popular dive is the **Jay Scutti** and the **Pride** that are slightly to the northwest of the **Mercedes**. The 97 foot long **Jay Scutti** is an old Dutch steel tug. She's completely intact and upright. After you tour the **Jay Scutti** follow the hawser tied to the tug's stern to the south. One hundred feet away waits the 95 foot long, steel hulled schooner, the **Pride**. Maximum depth for the two wrecks is 80 feet. If you have plenty of time and air you can even hit a third wreck, the **B.H. Lake**, a small fusiform sailboat that lies 200 feet northeast of the **Jay Scutti**.

Many people talk about the **Jim Atria**. She lies on her side. Although it is a great dive, only experienced divers should venture into her passageways; at a depth of 112 feet, with the world turned sideways, they can be disorienting.

If you can, sign up for a trip to the **Rebel**. She's upright and covered with growth. As you explore the 110 foot Norwegian freighter, look for spiny oysters, featherdusters and the beginnings of small coral trees.

In her heyday the **Panda**, now known as the **Jay Dorman**, was a luxurious sailing schooner. Although she settled on her port side, you can still appreciate her long, sweeping lines. Her 130 foot steel hull is now home to fish and crustaceans.

A great underwater experiment, the **Tenneco Towers** marks the boundary between Broward and Dade Counties. In a cooperative venture between Dade and Broward authorities, several sections of an old oil drilling platform were placed in a line heading directly offshore. Three of the enormous metal sections were placed shallow enough for divers. Far above the sandy bottom at 105 feet, the Tenneco Tower's gratings make ideal racks for thriving gorgonians and delicate shells. On the seafloor look for yellow jewel boxes.

MIAMI

Miami produces great football teams, a flashy TV series and outstanding artificial reefs. There are more than 40 wreck sites. Since 1981 Dade County has sunk 25 ships of more than 100 feet. If you like wreck diving, then you have to dive Miami. Ships and suitable materials are sunk in several different target areas. Adequately reviewing all of the diveable reefs would fill an entire magazine. As with the other regions, the Miami site descriptions include only a few of the most popular.

Haulover Reef contains several steel hulled freighters and a pair of Phantom F-4 jet fuselages. The **Doc DeMilly** landed upright in 140 feet of water after Air Force jets punched holes in her with dummy bombs. The 278 foot long ship now dis-



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plays a 70 foot profile that places much of it in range of the average sport diver.

Like many other vessels of her time, the 165 foot **Andro** was pressed into military service during World War II. She had been designed as a luxury yacht. Drop over her rounded fantail to the sandy bottom at 105 feet and you will find the twin props still mounted by the keel. The 137 foot **Narwal** sits in slightly deeper water, 118 feet. The **Narwal** sits upright and is intact down to the propellers.

Anchorage Area Reef, just south of Government Cut, is home to one of the area's natural reef sites as well as several wrecks. **Anchor Reef** took its name from the large anchor and chain that lie in 35 feet of water. The reef top begins in 18 or 20 feet and drops to 37. The coral is honeycombed with small passages.

Both **Billy's Barge** and **Leon's Barge** lie in less than 50 feet. But the most unusual site in this area has to be the **Radio Antennas**. Long sections of radio broadcast antennas were welded together to shape pyramids 26 feet tall and 23 feet across. The sculptures began attracting fish as soon as they were in place.

Just inside **Key Biscayne Reef**, divers can explore more than one dozen wrecks. In 135 feet of water, the **Lake-land** is the deepest member of this group. When she went down, the 220 foot ship turned turtle.

When the 120 foot **Biscayne Wreck** proved to be such a success, the 100 foot **Miracle Express** was placed only a few feet away. Only 55 feet deep, the two open hulls are ideal training sites.

Members of NAUI helped Dade County finance the sinking of the **Proteus**. Hundreds of barracuda now guard the 220 foot freighter. Seventy feet U/W, she draws a 30 foot profile even though her superstructure was removed.

You will find a **Cluster of Seven Wrecks** highly entertaining. In this group, spread out between 85 to 100 feet of water, you can swim through a 65 foot wooden shrimp boat (the **Sarah Jane**), several small barges and one 100 footer, and a 40 foot long steel houseboat.

When they sank the 235 foot long **Sheri Lyn**, they did it right. Small charges barely damaged the vessel. The **Sheri Lyn** rests upright, fully intact down to and including anchors, props and chains.

While the **South Seas** may have begun her life as a posh private yacht, supposedly a sister ship to Hitler's vessel, her checkered career included work as a freighter and a casino. Today the 175 foot **South Seas** is on the bottom 150 yards east of the Biscayne Wreck.

The **Orion** settled right next to a reef in 100 feet of water. With her propellers, engine and stack intact, she is certainly a photographer's delight.

Frequently visited wrecks also lie in the other artificial reef sites. While the hull of the 195 foot **Ultra Freeze** sits in 120 feet, because of her 50 foot profile it is easy to

tour the bulk of the wreck without descending below 100 feet.

Sport divers contributed \$13,000 for a fitting memorial to Mike Kevorkian, a Florida scuba diving pioneer. The 165 foot steel ship **Tarpoon** serves as a monument to this Miami sport diving leader.

From the top of her superstructure at 82 feet to the lowest point of her keel at 118, the 175 foot **Blue Fire** is a great dive. You need not drop below the main deck at 95 feet to examine most of her.

Miami has some good shallow natural reef dives. When you visit the Biscayne Wreck, you may very well head in shore

to dive at **Captain Darrel's**. With a reef top at 13 or 15 feet and a maximum depth of 40 feet, Captain Darrel's makes a great second dive on a two tank trip.

If you head in toward Key Biscayne from the wreck of the **Orion**, you will come upon **Emerald Reef**. Along this reef, in depths of 15 to 35 feet, you will find plenty of colorful subjects for fish portraits and macrophotography. **Fowey Rocks** takes its name from the nearby navigational light and is a local favorite. Depths range from 18 to more than 100 feet, but most of divers stay within the 25 to 50 foot range. ➤

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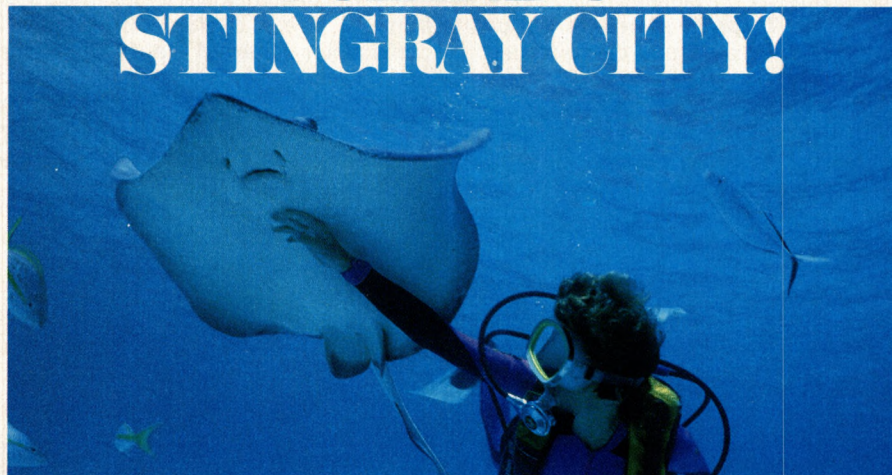
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FLORIDA MARITIME FESTIVAL

Southern Florida will lead the nation and the rest of the world in starting the Columbus 500th year anniversary celebrations with its International Maritime Festival and Shipwreck Convention of the Americas (IMFA). The event, which will take place July 18-30 at Marriott's Casa Marina Resort Hotel in Key West, will involve people from all over the world.



"There are special programs for scuba divers and skin divers," explains IMFA executive director R. Duncan Mathewson, III. In addition to the shipwreck convention, divers can relive a part of maritime America with IMFA's Dive Into History Passport. Available for \$249.95, it allows certified divers the opportunity to explore—and learn how to protect and preserve—the remains of sunken galleons and 18th and 19th century merchant ships under the guidance of a professional archaeological conservator.

Dive Into History Passport holders will be able to use the 10 dive package, which guarantees a minimum of five archaeology dives, at any or all of five well known dive services in the Keys.

The IMFA also has a special program designed for would-be divers. Entitled Underwater Archaeology for Kids of All Ages, this learn to snorkel/discover scuba experience is an introduction to U/W archaeology and marine life protection.

For additional program and ticket information contact International Maritime Festival of the Americas, Suite 111, Key West Seaport, 631 Greene Street, Key West, FL 33040; (800) 225-1543.

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TURKS & CAICOS ISLANDS PACKAGES

Now, Resort Management Services Limited, a new company recently established in the Turks and Caicos Islands, is making it much easier to dive there. It has developed 10 new dive packages for Provo and Grand Turk and has a toll free reservations number—(800) 637-7686.

Everything from all inclusive to basic dive packages has been developed. Packages feature Provo and Grand Turk

and offer resort hotel or condominium accommodations with full dive packages ranging from three tank boat dives per day to two tank boat dives with a night dive. The operators involved are Provo Turtle Divers, Flamingo Divers, Provo Aquatic Adventures and Omega Divers.

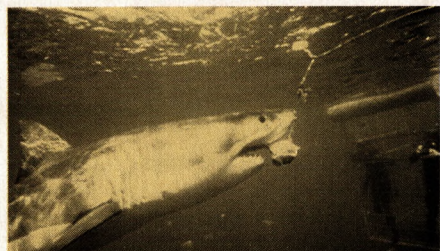
The lowest priced package is for quad occupancy for an eight day/seven night stay. The resorts and condos that are part of these packages include the Mariner Hotel, Erebus Inn, Le Deck Beach Club and Hotel, The Admirals Club and, on Grand Turk, Harbour Sands Condos.

Pan Am flies into the Turks and Caicos Islands six times a week. Departures are out of Miami and direct to either Provo or Grand Turk. Flight time is just more than an hour.

For more information or reservations, call (800) 637-7686 or (809) 946-4343. Write to Resort Management Services Limited at P.O. Box 52-6002, Drawer 150, Miami, Florida 33152. 🐠

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See & Sea Travel is offering a new shark adventure. Groups will board a live-aboard boat in San Diego, California, then film blue sharks from shark cages during two days of cruising. At the end of the two days, the boat will arrive at



Guadelupe Island. For the next six days the divers will film great white sharks. Two of these ultimate shark filming cruises are scheduled for 1989.

For information contact See & Sea Travel, 50 Francisco Street, Suite 205, San Francisco, CA 94133 or call (800) DIV-XPRT; in California (415) 434-3400. 🐠

MCDONALD JOINS KONTIKI

Kontiki Resorts has appointed Bill McDonald to its staff as assistant resort manager and director of dive operations. McDonald comes to Fiji after nine years as a course director with PADI Headquarters. He served as the southeast training coordinator, a member of the PADI Advisory Committee and lead course director at PADI International College in California.

For information on courses and travel packages, contact McDonald at Kontiki Resorts, c/o Gemini Pacific Corporation, 5140 Birch Street, Suite 300, Newport Beach, CA 92660; (714) 752-0173. 🐠

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COCONUT HARBOUR

Grand Cayman's Newest Dedicated Dive Resort

TEXT AND PHOTOGRAPHY BY GERI MURPHY

Grand Cayman has a brand new resort and it's a honey! It is just the right size for a small informal dive hotel, yet large enough to offer first class diving services. It has a great location with convenient access to the airport, George Town and Grand Cayman's top dive sites. Best of all, this resort has a terrific coral reef 20 yards from the dock.

Coconut Harbour was built on the site of a hotel known as Casa Bertmar, which was very popular among vacationing divers back in the 1970s. It achieved worldwide fame for a tame six foot green moray called Waldo that lived in the waters just offshore. The resort was sold, renamed South Cove and eventually closed. The property was then purchased by a Caymanian group. The old wooden hotel was torn down and carted away. In its place, a brand new hotel was erected.

As Coconut Harbour neared completion, an American investment group headed by Indianapolis real estate developer Joe Walesky decided to become involved. Some of the investors are divers and they fell in love with the resort at first sight.

Coconut Harbour has been made into a dedicated dive resort, meaning it is designed and operated specifically with divers in mind.

HOTEL FACILITIES

The resort is a small, cozy hotel, with Caribbean style pink stucco and white gingerbread trim. The main building contains a total of 35 rooms with kitchenettes—stove, sink and small refrigerator. Guests can prepare their own breakfasts, lunches or snacks. Every room is individually air-conditioned and contains a ceiling fan as well. The rooms are furnished with simple but tasteful rattan style furniture.

Four rooms have an oceanfront view and each has a king sized bed. The rest of the rooms overlook the hotel's pool

and are furnished with one queen sized bed and one twin.

Guest rooms are just a few steps from the pool, the dive center and the dock from which the dive boats depart. The resort is at the water's edge, but instead of sand there is ironshore coral. That is why there is such a good reef right in front of the hotel.

The centerpiece of this resort is a large freshwater swimming pool and adjacent spa that are kept sparkling clean. The pool area is surrounded by natural wood decking with chaise lounges and tables. It is a social gathering place as well as a

Coconut Harbour Resort was designed specifically with divers in mind. Guest rooms are just a few steps from the pool, dive center and boat dock. Quabbin Dives visits the best U/W sites off Grand Cayman. Top: A diver feeds a horde of hungry fish on the Oro Verde. Right: The sign for Coconut Harbour and Quabbin Dives.





Above: Guests relax and sunbathe by the pool at Coconut Harbour. The pool is the resort's centerpiece. Right: An oceanview room with a king sized bed. Bottom left: Quabbin Dives' 45 foot boat, *Quabbin D-Too*, heads out to a nearby dive site. Bottom right: Quabbin's dive lockers are tall enough for guests to hang wetsuits inside.



suntanning area. Divers often eat their lunches or dinners around the pool while discussing the day's dives.

The hotel grounds are beautifully landscaped with palm trees and flowers. Wooden walkways crisscross the grounds, leading guests from rooms to pool to the shore. A large veranda overlooks the sea, offering the ideal opportunity to enjoy spectacular sunsets.

Another major facility is the Cabana Bar and Grill—a large Caymanian style open-air bar and veranda that provide a spectacular view of the sea. While the resort does not have a formal dining room,

the open-air bar is equipped with a grill that serves breakfast, lunch and dinner at reasonable prices.

The Cabana Grill opens for breakfast at 7:00 am. The menu includes such hearty fare as eggs any style, Spanish or ham and cheese omelets or scrambled eggs with bacon.

The lunch menu contains a number of delectable items including: hot dogs, hamburgers, cheeseburgers, roast beef and chicken or tuna salad sandwiches, fish and chips or super subs. The dinner menu at the Cabana offers such entrees as New York strip steak, shrimp and

chips, baked chicken, stuffed shrimp or fish and chips.

Most guests go out at least one or two nights a week to dine at one of Grand Cayman's 40 different restaurants. Favorites among the divers include the Crow's Nest, Sunsetter, DJ's, West Bay Polo Club and, of course, the divemasters favorite watering hole, The Lone Star Bar and Grill. You can travel to these restaurants either by rental car (highly recommended) or by calling a taxi.

DIVE CENTER

The heart and soul of Coconut Harbour Resort is the dive center. It is next to the pool, right in the center of the resort. Quabbin Dives Cayman Ltd. is owned and operated by Arthle Evans. He has been in the diving business for more than ten years and has built a sizable clientele of experienced divers who return to Cayman often. Arthle was formerly right in George Town; he has moved his entire dive operation to Coconut Harbour.

Quabbin has a total of three air compressors; two Makos and a Bauer. They have a combined pumping capacity of more than 50 cfm. Three giant high pressure air storage cylinders allow the staff to fill all the scuba tanks without ever turning on the compressor. Quabbin Dives maintains a large inventory of 176 aluminum rental tanks—50 of the big 80s and 120 of the lighter 72s. There are also one-half dozen short 63s for women and/or students.

Quabbin provides private equipment storage lockers for all guests. Each room is assigned a locker sufficiently tall to hang up a wetsuit or body suit. The lockers are behind the dive center, next to the freshwater rinse tank.

Quabbin operates two dive boats on a daily basis and keeps a third on standby. *Quabbin D-Too* is the larger of the two—a 45 foot custom monohull that can carry up to 24 divers. It is kept on the west side of the island and picks up guests right at the resort dock or town pier.

Quabbin Diver is a 36 foot custom monohull that can carry up to 16 divers. It is kept at Governor's Sound and used for afternoon trips to the **North Wall** and **Stingray City**. The *Theresa-D* is a 39 foot combo diving and fishing boat that can carry up to 15 divers. It is reserved for use during busy periods or used for private groups.

Quabbin Dives operates regularly scheduled boat trips twice daily. The morning trip is a two tank dive that departs Coconut Harbour at 8:00 am. This early departure ensures first pick of the best wall sites as most Grand Cayman dive boats depart later. The morning dive trip returns to the hotel before noon, thus allowing time for lunch and a rest.

The afternoon trip is a one tank dive that departs Governor's Sound at 1:00 pm, again, earlier than most of the other



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COCONUT HARBOUR

dive boats. Coconut guests are taken from the hotel to the boat dock by truck. The early afternoon trip is very popular with underwater photographers because the sun is still high in the sky, thus increasing the ambient light underwater by as much as one extra f/stop. The afternoon dive trip returns to the hotel at approximately 4:00 pm.

Night dives are available upon request. They generally depart after dinner at about 6:30 (summer schedule) and return around 9:00 pm. Night diving is popular on Grand Cayman, as the seas are calm and the dive sites are close to the resorts. **Royal Palms Ledge** is a favorite because of its prolific marine life.

Coconut Harbour's dive packages generally include the morning two tank trips. Afternoon and night dives are optional, at a modest cost.

One of the most attractive aspects of the Coconut Harbour package is unlimited shore diving. This resort has one of the best coral reefs (Waldo's) only 20 yards directly off the hotel. Guests can make a shore dive in the early morning, afternoons and evenings. Scuba tanks are not confined and guests can access their dive lockers whenever they choose.

DIVE SITES

What makes Coconut Harbour so ideal is its location for diving. There are many excellent dive sites in the area that are only a two to five minute boat ride away. In addition, Coconut Harbour is between the best dive sites on the west side of the island and those on the south side (less than one mile around the southwest corner of the island). Regardless of which way the wind is blowing, there is always a calm area in which to dive.

Part of the magic of Grand Cayman is the remarkably good diving conditions. Water temperatures range between 80 and 82°F. The surface is generally flat calm and underwater visibility runs between 90 and 150 feet.

NEARBY DIVE SITES

Among the dive sites that are close to the resort, **Eagle Ray Rock** is probably the prettiest. This drop-off was named for the magnificent eagle rays that cruise along its edge. The drop-off begins at 55 feet and quickly goes vertical.

Devil's Grotto is an excellent second dive of the morning. In 50 feet of water, this high profile reef comes to within six feet of the surface. It is honeycombed with a labyrinth of winding coral tunnels, caves and caverns.

Close by is **Eden Rock**, another popular shallow reef dive. Depths range from 15 to 35 feet and the area is frequented by both scuba divers and snorkelers.

Another nearby reef is **Armchair**, named after a giant, odd shaped sponge that resembles an overstuffed living room armchair. Still other nearby sites include **So-to's Reef**, the **Balboa Wreck** and **Smith's Cove**.

Last but not least, there is **Waldo's Reef**—a dive site right in front of Coconut Harbour. It is regarded as one of the best shallow reef dives on the west side of Grand Cayman. Dive operators from hotels miles away will often dive this site.

Waldo's Reef begins only 20 yards off the resort dock, but extends another 80 yards or so. The bottom slopes gently and the reef profile consists of a series of spur and groove coral formations at an average depth of 50 feet. The reef has many lovely tube sponges, azure vase sponges, seaplumes and other forms of lush marine life. It is best known for its residents, which include two large green moray eels, a friendly barracuda, a 150 pound black grouper and a smaller, 75 pound grouper. There is also a tame yellow coney that lives near an abandoned anchor. The reef is an underwater circus with incredible animal acts. Divemasters often feed these creatures and put on a show for the hotel guests. This reef is also an excellent night dive as it is loaded with macro critters.

SOUTH SIDE DIVE SITES

Coconut Harbour is one of the few Grand Cayman resorts that dives the South Sound area (weather permitting) on a regular basis. This is probably because the resort is closest to the island's southwest corner. While the drop-off begins slightly deeper in this region, the reef profile is awesome.

Pinnacle Rock is a stunning coral formation. It is an immense pillar 80 feet tall and 35 feet in diameter. Cylindrical in shape, this vertical formation rises from the floor of a sand ravine that spills over the edge of the drop-off. The top and vertical sides of this formation are jam-packed with hard corals, gorgonian fans and colorful sponges of all kinds.

South Sound Wall is another drop-off that begins in 70 feet. The face of this formation is deeply etched with large grottos and narrow coral ravines. **Palace Wall** is another drop-off, named for a 1903 shipwreck that lies inshore. Other South Sound sites include: **Japanese Gardens**, **The Grotto** and **Archway**.

WEST SIDE SITES

The most popular diving area for Quabbin trips is the west side of Grand Cayman. These dive locations are almost legends within their own time, as each one offers some unique undersea attraction.

Big Dipper is a steep sloping drop-off marked by a gigantic basket sponge at a depth of 105 feet. The sponge is so huge it was named after the constellation. **Sentinel Rock** is a small coral pinnacle jut-

(Continued on Page 182)

COCONUT HARBOUR

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Of the 45 wrecks so far found and dived in Truk Lagoon, few are more historic than the I-169—one of the largest and fastest Japanese submarines of World War II. The story behind this wreck is both fascinating and bizarre, for the hand of fate certainly dealt this gallant warrior an ironic blow.

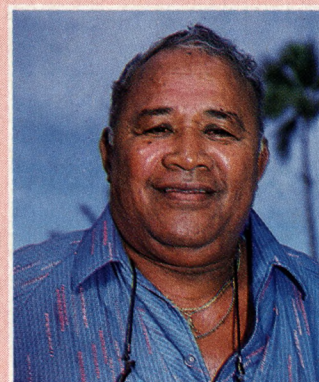
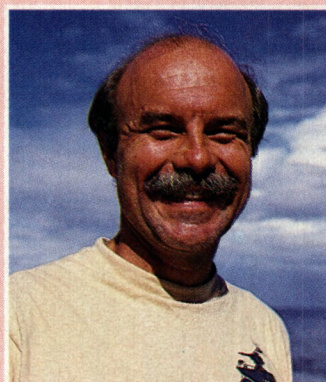
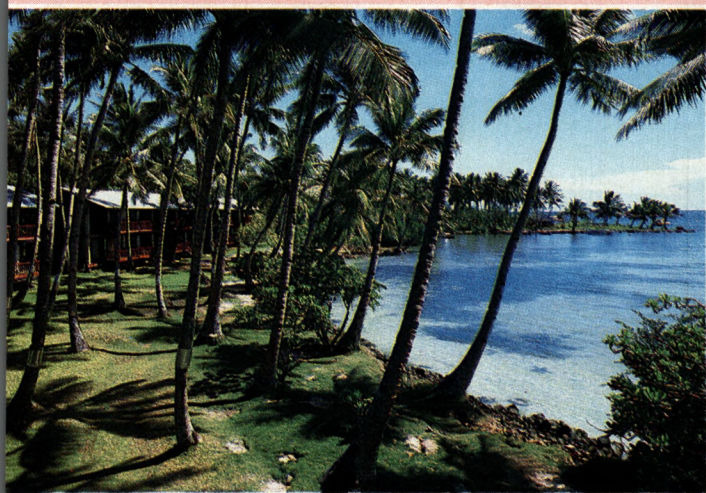
I-169 SPECS

The I-169 was an I-Class submarine cruiser of awesome size and power. These leviathans were designed to operate long distances without refueling. The I-169 was one of eight built of the KD6A type. This small family of subs included the I-168 through I-175.

The giant sub had three names. Her original designation was I-69. She was renumbered I-169 in 1942. She was also called the *Shinohara* after her

**TEXT AND PHOTOGRAPHY
BY GERI MURPHY**





Opposite page: Clark Graham photographs marine life on the *I-169*. Left: The Truk Continental Hotel is on the shore of Truk Lagoon. Above left: Clark Graham, co-owner of Micronesia Aquatics. Above right: Kimiuo Aisek, owner of Blue Lagoon Dive Shop.

captain, Commander Suigeo Shinohara.

Although some books indicate this type of sub to be 330 feet long, the *I-169*'s actual Length Over All (LOA) was 343.5 feet. She was immense when compared to the average German U-Boat measuring 250 feet. The I-Boat was bigger and launched faster torpedoes than any American submarine. This lumbering giant possessed the speed of a football quarterback. Powered by twin 9,000 hp diesels, the *I-169* had a maximum speed of 23 knots on the surface. She could stalk and overtake any freighter or tanker at sea.

Underwater, the sub was much slower. She could achieve a speed of 8.2 knots and a maximum depth of 246 feet.

As for armament, the *I-169* was well equipped for battle. She was fitted with six torpedo tubes—four at the bow and two at the stern. She carried a lethal load of 15 torpedoes, each measuring 21 inches in diameter and packed with 1,200 pounds of explosives. These torpedoes contained enough fire power to sink an aircraft carrier. By 1944, the *I-169* carried Type 95 long range torpedoes that used oxygen and kerosene for fuel. These torpedoes could travel at 49 knots

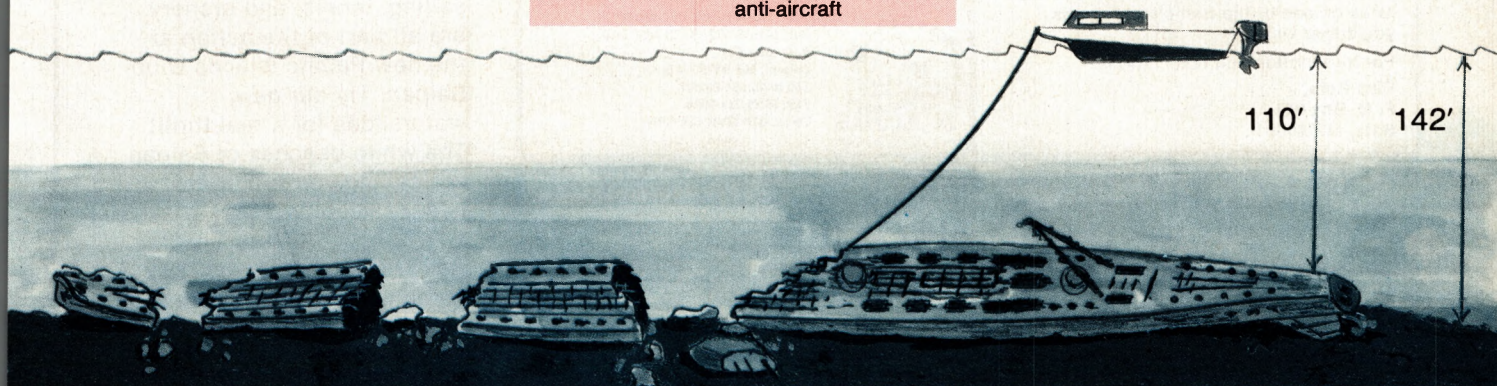
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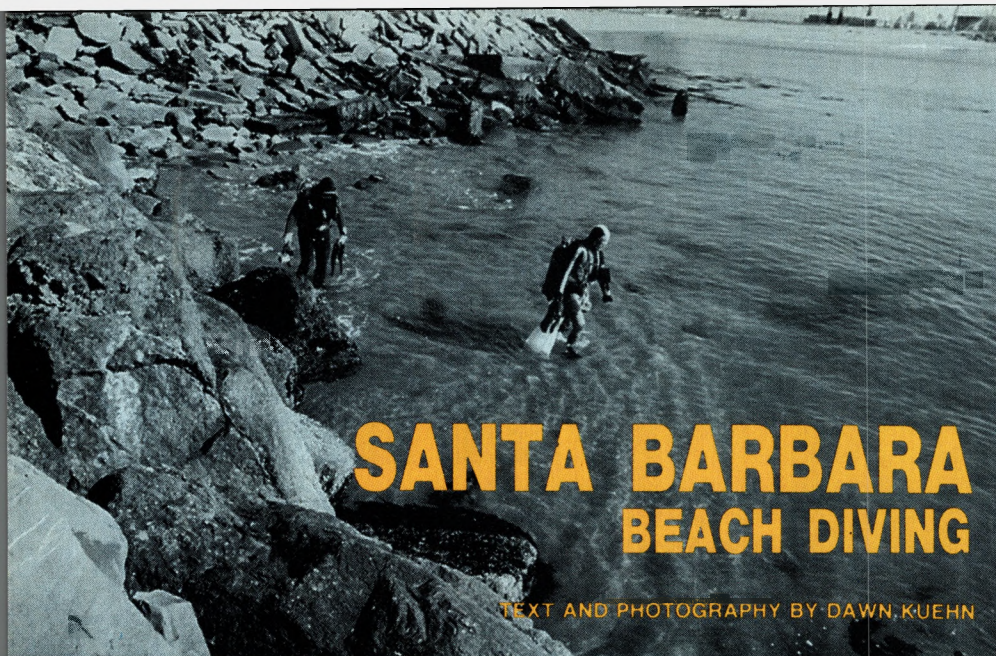


Left: A Truk Continental Hotel guest room with twin queen sized beds. Below: Dive boats load passengers at the Truk Continental Hotel pier. Bottom: The *I-169*'s Length Over All was 343.5 feet. Powered by twin 9,000 hp diesels, she could reach a maximum of 23 knots on the surface and overtake any freighter or tanker at sea.

I-169 JAPANESE SUBMARINE

Name	<i>I-169/Shinohara</i>
Length	343.5'
Beam	27'
Draft	15'
Propulsion	Twin diesels/ 9,000 hp
Surface Speed	23 knots maximum
U/W Propulsion	Electric motors/ 1,800 hp
U/W Speed	8.25 knots maximum
Range	14,000 miles at 10 knots
Depth	245 feet maximum
Torpedo Tubes	6, 4 forward, 2 aft
Torpedoes	15, 21" Type 95
Deck Gun	10cm (100mm) high angle cannon
Machine Gun	1/twin barrel 13mm anti-aircraft





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For those of us who find it hard to come up with the money for charter boats—yet dearly love our sport, relief is spelled: beach diving. California's coastline has an abundance of beach diving and our exclusively boat diving buddies really don't know what they're missing.

Take, for example, beautiful Santa Barbara County. Not only is Santa Barbara

dramatically beautiful topside, with the San Marcos mountain range sweeping to the Pacific shore, but off her beaches is a proper introduction to California diving. Kelp forests host a myriad of creatures from the brilliant orange kelp snail (*Norrisia norrisi*), that eats and sleeps in the canopy of fronds, to the throngs of fish that feed on those who feed on kelp.

Check with one of the helpful local dive shops in the Santa Barbara area for gear, air and directions. If you haven't done much beach diving, it's also a good idea to go over procedures for safe entries and exits in the surf. The most popular spots to dive are listed below.

Mesa Lane: This is the name of a street that dead ends into a footpath to the beach. The path leads to a large number of stairs with an overlook that affords a panoramic view of the beach and ocean so you can check out the visibility and surf conditions. **Mohawk Reef** is worth the exercise down and up the stairs because it has many fascinating underwater ledges, scarps and small caverns. Bring your dive light, for snoozing swell sharks can often be found snuggling together several strong in the recesses. Large calico bass and orange garibaldi (the California state saltwater fish) make great photographic subjects. Sheep crabs, California's special brand of spider crab, may also be found here—scuttling about pretending to be menacing. This is where I saw my first light bulb tunicates (*Clavelina huntsmani*) cluster mounted on one of the reef walls. These inch long creatures look like Edison's invention—filament and all.

Be aware there are no facilities here. Take the 101 Highway to Cabrillo Boulevard in Santa Barbara. Cabrillo turns into Shoreline Drive, a beautiful route show-

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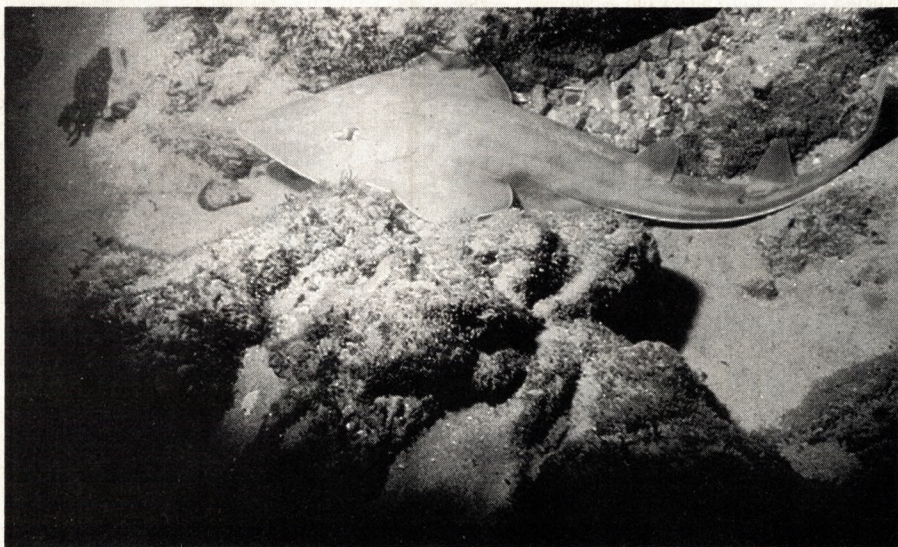
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Not only is Santa Barbara County dramatically beautiful topside, but off its beaches is a proper introduction to California diving. There are several good sites available. This large skate was photographed just off the beach in the Santa Barbara area.

ing off some dramatic scenery. From Shoreline turn left onto Cliff Drive and left again on Mesa Lane. Just north of this site, off Cliff Drive, is Arroyo Burro State Beach, with more diving opportunities.

Arroyo Burro State Beach: If the visibility discourages diving, there's a great little restaurant by the sea here—The Brown Pelican—and its hot blueberry bran muffins are truly outrageous! A

small cliff next to the restaurant affords a view to check the swells, the calm period between wave sets and visibility. There are two major kelp beds from which to choose. A river outlet runs between them. Generally, visibility will be better diving the north kelp bed since the current generally flows north to south. The bottom terrain changes constantly here; sometimes it's sandy with only the reefs sup-

porting the kelp holdfasts showing. Sometimes the sand is swept away, revealing the underlying bedrock, which looks like giant streams of solid rock. Thinking they are well camouflaged by the large kelp fronds, the foot long rubberlip surperch (*Rhacochilus toxotes*)

(Continued on Page 160)

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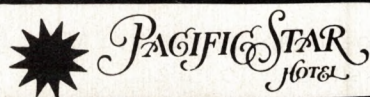
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California's SAN NICOLAS ISLAND

SENSATIONAL DIVE SITES FOR THE SERIOUS DIVER

BY
BARRY KRAUSE AND
PAUL MCCALLUM



photos/Paul McCallum

San Nicolas Island is one of California's premier dive sites. Seventy-five miles off the coast of Los Angeles, it is accessed by a boat ride of about eight hours. Boats usually travel to the island at night, while passengers sleep. On the return cruise, made during daylight, you may see small pods of various species of whales, including killers, finbacks, California grays, blues and dolphins.

San Nicolas is the farthest of the Channel Islands from the Southern California mainland. The first people on this island were coastal Indians who arrived in pre-historic times, probably by island hopping out from the mainland using primitive boats or canoes. Eventually the Franciscan missionaries chartered a boat and took the Indians to the mainland.

The next inhabitants of San Nicolas

were sheepherders. Eventually, San Nick ended up in the possession of the U.S. government and is now under the jurisdiction of the U.S. Navy.

The navy has a missile tracking and guidance set-up on San Nick where personnel are trained. Civilians are not allowed on the island without special permission. Also, the navy maintains a 300 yard buffer zone around the island, and

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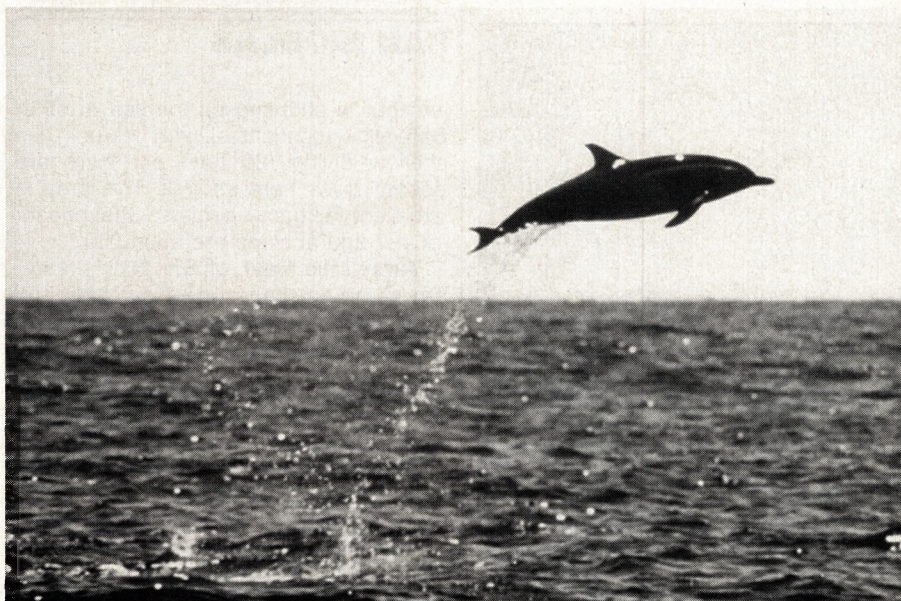
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Opening page: A group of sea lions (*Zalophus californianus*) at San Nicolas. Left: This high leap by a common dolphin (*Delphinus delphis bairdi*) is typical of the species. Groups of these animals are often seen while cruising home from San Nick.

doesn't want civilians, including sport divers, closer than that.

In 1988, 49 sea otters were transplanted to San Nicolas. As of last October, 14 of them could still be found there. Some migrated back to the mainland, some died and at least one was found shot to death. Four more otters have been added to the colony, which now numbers 18.

The U.S. Fish and Wildlife Service sometimes enforces the navy's 300 yard limit to help protect the otters from harassment. Also, California Fish and Game has placed yellow tags on certain lobsters. Anyone catching a lobster with such a tag should call Fish and Game or the University of Santa Cruz with information on where it was found.

San Nicolas is a great place for serious

diving because the waters surrounding it team with an abundance of marine life such as giant starfish, nudibranchs, rockfish, abalone, unusual shelled creatures and the now rarely seen black sea bass. Such marine life is in large numbers and size because San Nicolas Island is so far from the mainland.

In the waters near San Nick, large pelagic fish such as sharks and sunfish are often seen, as are schools of barracuda. Electric rays (also called torpedo rays) are also found at San Nick.

California sea lions are abundant along the shores of the island. The smaller animals will sometimes approach divers.

SAN NICOLAS DIVE SITES

Seven Fathom Reef, three miles off the west end of San Nick, is for intermediate divers. The visibility here is excellent. It is a deep dive, with walls dropping to 150 feet. Seven Fathom Reef is good for underwater photography because it has a wide selection of marine life.

Dutch Harbor is another intermediate dive site on the southeasterly coast of the island. It is a choice area to dive if the

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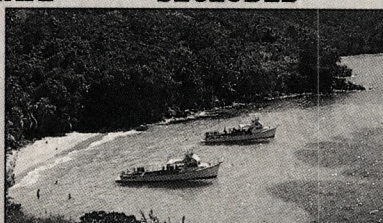
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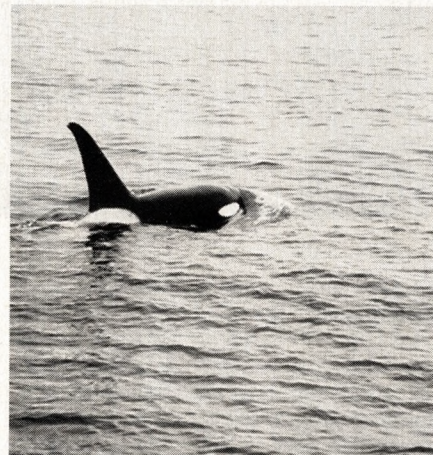
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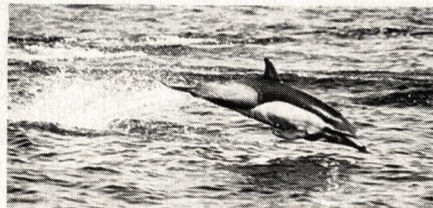
SAN NICOLAS

weather is churning up the sea at other San Nick locations. Dutch Harbor has shallow diving (20 feet) but there are deeper dives here as well. This area is excellent for game hunters. Sheephead, lobster and abalone are abundant.

Three Mile Reef, off San Nick's northern shore, is made up of canyons and drop-offs with depths averaging 80 to 100 feet. It is an excellent site for photog-



Above: A killer whale (*Orcinus orca*) 60 miles off the coast of Los Angeles, seen during a trip home from San Nicolas. Below: A common dolphin off San Nick.



raphers, but this is an open water dive with strong currents and surface chop. This a location best left for the more experienced diver.

The Boilers are about two miles off the west end of San Nicolas. They are so-called because the reef is just below the surface and the water in the area is usually churned up. This reef is sometimes above the water at low tide. The visibility at The Boilers isn't as good as it is at other sites, but this reef offers some of the best game collecting territory. Huge lobsters and abalone are prevalent. Because of its treacherous surge, The Boilers is an advanced dive.

GETTING TO SAN NICOLAS

San Nicolas can only be dived by boat and owing to its distance from the mainland—75 miles—only experienced skippers make the run. The best way to visit San Nick is to book passage on a charter dive boat. Various commercial dive boats offer one day and multi-day trips from the mainland, especially during lobster season (October to March).

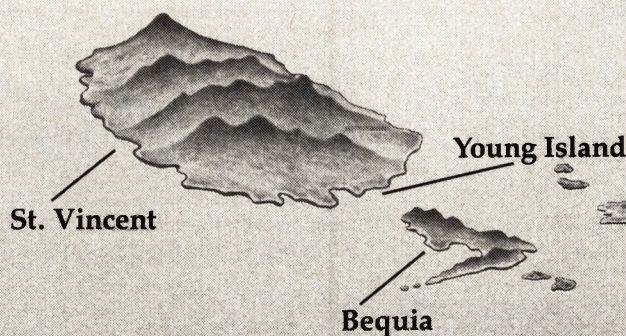
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DATELINE MICRONESIA

(Continued from Page 145)

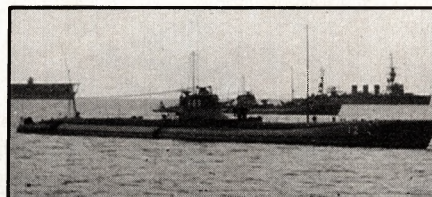
for 6,000 yards (more than three miles).

Topside, the sub was armed with a 10cm deck gun—a large canon that could fire a four inch diameter shell. The conning tower had a twin barrel 13mm anti-aircraft machine gun for defense against surprise air attacks.

HISTORY

The history of the *I-169* is a fascinating tale of gallantry, good fortune and mishap. She was a heroic fighting ship with an amazing streak of good luck—until one day in the spring of 1944.

The sub was built by the Mitsubishi Shipyard in Kobe, Japan and launched on September 28, 1935. Although there were eight subs of this type, they were



This photo, showing the *I-169*, was taken at Arirke-Wan, Kyusyu, Japan in 1936.

not all built exactly the same. In fact, the vessels were constructed at three different shipyards and each had minor modifications in design.

The *I-169* started her war career at the beginning of the hostilities with the U.S. She was deployed at the entrance to Pearl Harbor on December 7, 1941. During this period the sub was trapped in an American anti-submarine net and struggled to free herself for nearly 50 excruciating hours. She finally descended to the bottom and slipped out from under the grip of the stainless steel cables. Some of her sister subs were not so lucky: the *I-170* and *I-173* were lost shortly after the Pearl Harbor raid.

The *I-169* next turned up at Midway—one of the most famous air/sea battles of WW II. She patrolled the eastern approach to Midway but did not engage in battle. However, her sister sub, the *I-168*, launched the two fatal torpedoes that sank the U.S. aircraft carrier, *Yorktown*.

After Midway, the *I-169* spent the next two years crisscrossing the Pacific Ocean, carrying out assignment after assignment. She patrolled the waters off Australia and sank a merchant ship. She was involved in the battle for Tarawa. She fought in the battle of the Aleutian Islands, off Alaska. The sub operated out of many of Japan's most famous Pacific bases, including Kwajalein, Rabaul and Truk. She survived two and one-half years of war duty while all seven of her sister subs

perished. On April 4, 1944, the *I-169*'s luck ran out. She became another victim of World War II—more by accident than by injury from the enemy.

The *I-169* was moored in the middle of Truk Lagoon, in a row with five other subs. She had been placed on mooring because the heavily protected submarine pens were filled with other subs under repair. The captain and 24 crew members had gone ashore to obtain supplies and make arrangements for minor repairs.

Ever since Operation Hailstone was launched on February 17 and 18, U.S. carrier forces had been making regular air raids on Truk Lagoon facilities. A surprise attack at 11:00 am made it necessary for the six subs to make an emergency descent to the lagoon bottom. After the raid, only five subs surfaced. The *I-169* was missing.

A salvage vessel was quickly dispatched to find and hopefully recover the lost sub. Its crew located the sub and sent hardhat divers down to inspect the disabled vessel. What they found was not good news. The control room of the sub was entirely flooded and many of the officers and crew had drowned.

One of the *I-169* crew members had failed to close a control room surface ventilation valve and sea water had burst into the compartment. The subsequent flooding had shorted out the sub's electrical systems, rendering her inoperable. No one will ever know whether this accident was caused by the rush of the emergency descent, too few crew members or simple crew error.

Watertight hatches between submarine compartments had prevented the entire sub from flooding. Salvage divers rapped on the sides of the sunken hulk and immediately received return signals. Some of the *I-169* crew members were still alive in the forward and aft compartments.

The salvage crew worked feverishly in a valiant attempt to raise the stricken sub and save the trapped men. Their efforts were hampered by repeated air attacks that forced them to run for cover. Then the salvage sling broke under the immense weight of the water filled sub. The salvage crew then attempted to run air hoses down to the sub and blow out the flooded compartments, but this plan also failed. Meanwhile, the *I-169* crew remained alive and awaiting rescue for three days. In the end, there were no more signals coming from within the hulk and the salvage crew members were ordered to abandon their efforts.

As the weeks progressed, the bombing of Truk Lagoon continued and the Japanese command feared their defenses would soon be overrun. It was decided that the *I-169* should be destroyed so it would not fall into enemy hands. In May 1944, the Japanese deliberately dropped depth charges on their own sub, destroying the entire forward section. The *I-169* would never sail again.



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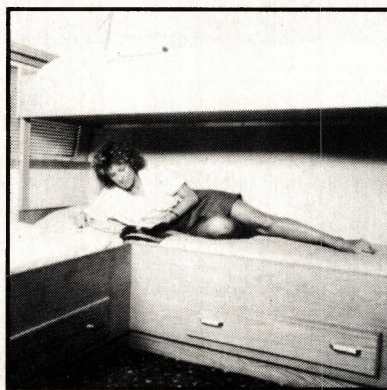
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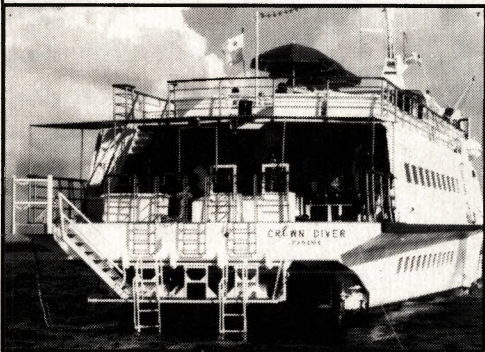
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DATELINE MICRONESIA

What of the crew that had been ashore during the accidental sinking? The captain and the 24 crew members were reassigned to other subs and most died in subsequent battles. Only one member of the original I-169 crew survived the war. Submarine service was indeed perilous.

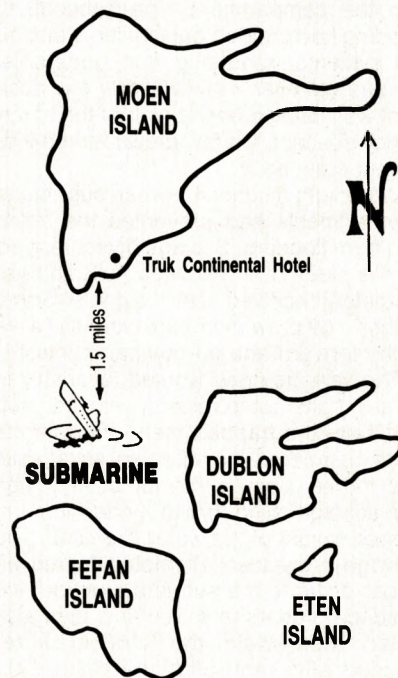
DISCOVERY

For the next 26 years, the I-169 remained silent and untouched. While her general location was documented, no one had actually found her. The hull of this vessel remained unseen for two and a half decades.

Then, in 1970, two California divers visited Truk to explore this lagoon of sunken ships. They heard rumors of a sunken sub but its location was unknown.

A larger group of divers, including Al Giddings, well known underwater film-

LOCATION OF SHINOHARA SUBMARINE TRUK LAGOON



maker, returned in 1971. Accompanying Al was SKIN DIVER publisher Paul Tzimoulis, who brought along highly sensitive electronic depth recorder equipment.

Aided by starfish diver Kimiue Aisek, the divers found the I-169. Giddings documented the search, discovery and exploration of the sub—resulting in the classic diving film, *Silent Warrior*.

The exploits of this dive group and the subsequent film caused quite a stir in Japan. Funds were raised for the recovery

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DATELINE MICRONESIA

of the I-169 crew members who had been missing for so many years.

The Fukada Salvage Company of Osaka was hired to conduct a salvage mission and recover the war dead. Al Giddings was once again invited to return to Truk to document the recovery in September 1973. The resulting film, *Search for the Shinohara*, appeared on network television. The bones and personal effects of the crew were taken from the sub and cremated in a religious ceremony witnessed by 24 family members plus the one remaining crewman.

WRECK TODAY

Today, the wreck of the I-169 remains a compelling undersea curiosity for visiting divers. While the sub may not be the largest or most beautiful wreck in the lagoon, it is still a strong attraction for students of World War II history.

FOR MORE INFORMATION

For more information and brochures about diving Truk Lagoon contact the following:

Blue Lagoon Dive Shop

P.O. Box 429

Moen, Truk

Eastern Caroline Islands 96942

Telephone: 796

Kimio Aisek, owner

Gratvin Aisek, general manager

Micronesia Aquatics, Inc.

P.O. Box 57

Moen, Truk

Eastern Caroline Islands 96942

Clark & Chineina Graham, owners

SS Thorfinn

Thorfinn Dive Cruises

50 Francisco Street

San Francisco, CA 94133

(800) GO 2-WREX

Lance Higgs, owner

The Truk Continental

P.O. Box 340

Moen, Truk

Eastern Caroline Islands 96942

Telephone: 727

Eddie Benavente, manager

The sub is one mile south of the Truk Continental Hotel. Dive boats depart from the hotel dock and are anchored over the wreck in less than 10 minutes. The wreck is dived regularly by both Blue Lagoon Dive Shop and Micronesia Aquatics, with their dive boats departing directly from the hotel dock.

The sub lies on an uneven sand bottom composed of undulating hills and valleys.

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Diving depths range from 110 to 145 feet. Underwater visibility in this part of the lagoon can range from 60 feet on a murky day to 100 feet on a good day. Water temperatures average 82°F.

Most diving is concentrated on the rear half of the sub as this is the portion of the hull that remains intact. You can immediately appreciate the destructive power of depth charges for the front half of the sub is a twisted pile of metal wreckage scattered across the bottom. The conning tower has been blown off the hull and lies on its side.

Although somewhat deteriorated, the rear part of the sub is intact. The deck has large open patches where the metal has corroded and you can peer down into a maze of pipes and tubes. The major points of interest include three hatches—one leading to the engine room, the aft hatch leading to the aft torpedo room and the torpedo loading hatch.

MICRONESIA TRAVEL AGENTS

If you are planning to tour several islands, chances are you will wish to secure the services of a travel agent who specializes in booking dive trips to Truk and other parts of Micronesia.

Aqua-Trek
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(800) 826-0057 (CA)

Continental Newmans Tours
(800) 421-3326
(800) 252-4616 (CA)
(213) 552-0901

Poseidon Ventures Tours
(800) 854-9334
(714) 644-5344

Sea Safaris
(800) 821-6670
(213) 546-2464

See & Sea Travel
(800) 348-9778
(415) 434-3400

Trip—n—Tour
(800) 348-0842
(800) 843-8956 (CA)

Tropical Adventures Travel
(800) 247-3483
(206) 441-3483 (WA)

A large triangular frame rises from the deck next to the aft torpedo room hatch. It once supported the radio antenna strung between the conning tower and the top of this frame. Today it is covered with beautiful soft corals—in pastel pink, white or red. In addition to the soft corals, there is a multitude of marine life growing on this frame, including zig-zag oysters, sponges and green algae.



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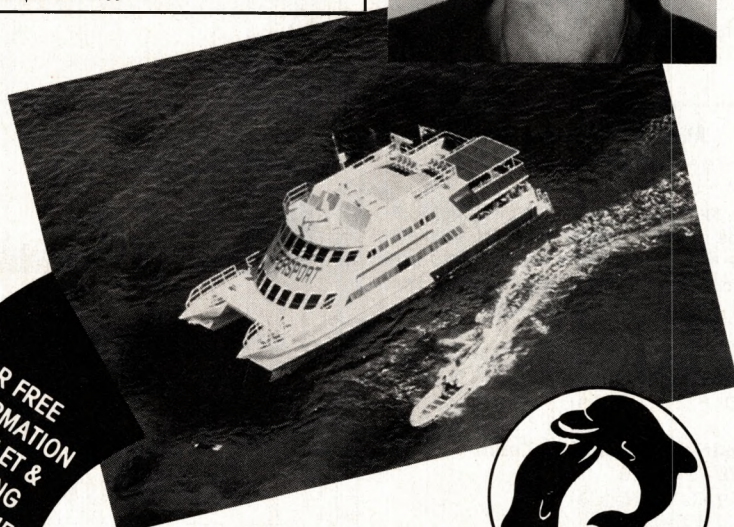
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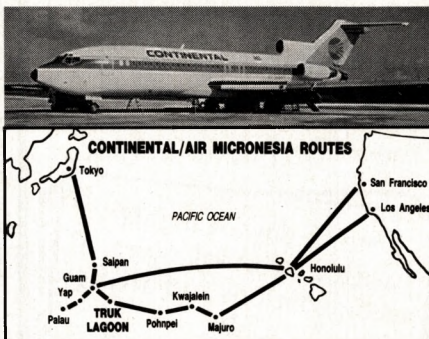
DATELINE MICRONESIA

Moving to the stern of the sub, divers encounter the diving planes, rudder and the twin, high speed propellers. All of these items are still recognizable, although many are adorned with festive bouquets of soft corals and sponges. One of the most impressive sights is the I-169's stern torpedo tubes, from which her 21 inch torpedoes were once launched. Despite her depth, the wreck attracts a surprising amount of fish. Fusiliers are often seen swirling around the stern, while a school of 30 Pacific barracuda hangs off the wreck at the edge of visibility. Other fish seen include small tuna, jacks, rays and an occasional shark.

Divers must move quickly in order to cover all of these points of interest in the allowable no decompression bottom time limit of 10 minutes. The first time they visit her divers do not generally feel the full impact of the wreck until the dive is over and they have had time to reflect on the encounter. A visit to the I-169 is like a 50 year walk back through time to a gallant era of submarine service. No matter how many wrecks are discovered in Truk Lagoon, the I-169 will always be special.

HOW TO GET THERE

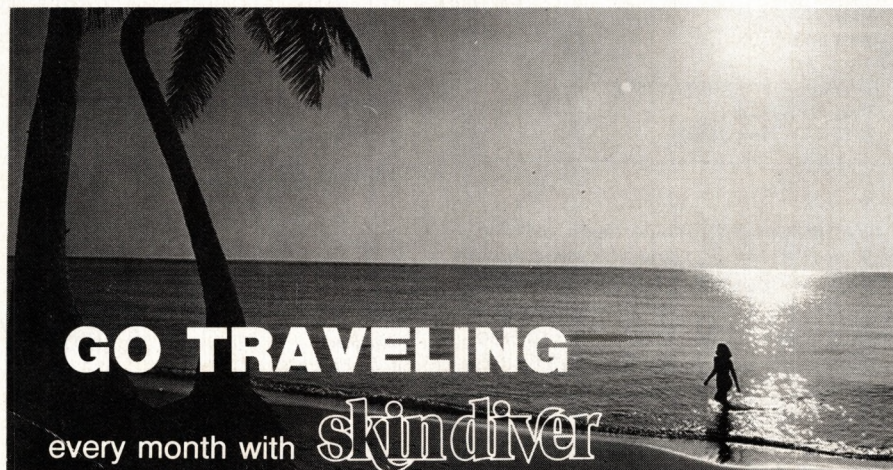
Truk Lagoon is in the center of Micronesia and only 632 miles southeast of Guam. The best way to reach Truk is to fly from Los Angeles to Guam on board a Continental Airlines DC-10. At Guam



you transfer to Continental/Air Micronesia's 727 jet that takes you to Truk Lagoon in less than 1.5 hours. You can make the trip from Los Angeles to Truk Lagoon in one day, with no overnight stops. The flight lands at Moen Island, right in the middle of the lagoon.

CARIB INN FAX

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SANTA BARBARA

(Continued from Page 147)

hover seven or eight strong close to the stalks. You can get quite close before they break ranks and move slowly on. Schools of opaleye and halfmoons swim in and out of the forests of pulsing kelp. Bring your wide angle lens and close-up kit, these fish aren't shy. The pert orange cleaner wrasses, señoritas, move with confidence around the bigger fish, although pestered (forcefully at times) for a cleaning job.

This dive site has all the provisions that make beach diving most enjoyable: food, bathrooms, showers, picnic tables, close parking and plenty of happy people.

Refugio State Beach: Driving north on Highway 1, you spot a beautiful lagoon with palm trees. That's your first glimpse of Refugio. Many dive shops from Santa Barbara and Santa Maria take their classes here on weekends for their check out dives, so if you can dive during the week, do so. Refugio has all the same facilities as does Arroyo Burro—with one difference: At Refugio you can also camp by the sea. The diving here is an exploration of ledges. A series of one-quarter mile long rock ledges runs parallel to the beach. The ledges are covered with strawberry anemones, magenta algae, tunicates, tiny spider crabs, nudibranchs, brittlestars, starfish of every shape and color and bright orange sponges. Bring your macro framers and strobes. Depending on the time of year, the kelp beds can be quite extensive. The most unique features at Refugio are its ledges. It can be heart stopping when you're concentrating on this incredible macro world

FOR INFORMATION

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Surf Conditions (805) 962-SURF
Marine Weather (805) 962-0782

(as I was on one dive) and turn to see a curious five foot bat ray just a few feet away, trying to see just what you are looking at!

Tajiguas: If you want to avoid having to pay the \$4 entry fee at Refugio and don't mind not having any facilities, you might try Tajiguas. The diving is a lot like Refugio's but the beach is more secluded and parking is along the highway next to the railroad tracks. It's only two miles farther north and there's a footpath down to a beautiful beach/cove. If you've never seen an angel shark or shovelnose guitarfish, this is the place to have an encounter, especially in the sandy areas away from the kelp beds where these fish lie mostly buried. Just make sure you don't accidentally kneel on one. They won't hurt you, but the shock from this all-too-close encounter will teach you to look before you settle on the bottom. »

PADI STORE OWNERS HONORED

Dick Bennett of Bennett Academy of Ski & Scuba in Wauwatosa, Wisconsin, and John Wall of The Dive Shop in Falls Church, Virginia, received the 1989 PADI Diving Excellence Award for Community Service. PADI executive vice president Al Hornsby presented Bennett and Wall the award at the annual PADI Member Social prior to the 1989 DEMA show.



Bennett and Wall received the award for their long standing commitment to the Muscular Dystrophy Association, and for their urging that led to PADI becoming the dive industry sponsor. This effort raised \$300,000 for MDA in 1988 and the target goal for 1989 is \$1 million.

The Diving Excellence Award was established in 1986 to recognize organizations and individuals who have made significant contributions to diving. Dr. Ray Rogers, developer of the Recreational Dive Planner, received the award in 1988 and DAN received it in 1987.

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Barbachano Tours now offers all-inclusive dive packages to Hawks Key in the Florida Keys. The certified diver seven night packages includes eight, two tank dives, boat transportation, weightbelt and snorkel equipment. The learn to dive seven night package includes full PADI or MDEA certification plus four two tank dives, boat transportation and all equipment. Both packages are offered for the same price. Other inclusions are gourmet breakfast every day, a champagne sunset cruise and all taxes. Three night dive packages are also available, and include four two tank dives for certified divers.

Hawks Cay also offers other diversions and amenities. The Zoovet Dolphin Training Center is located here. Guests can actually swim with the dolphins. A tennis facility with underground irrigated clay courts; guided nature exploration experiences; and a full marina for fishermen are just some of the amenities.

For more information or reservations, contact Barbachano Tours at (800) 327-2254.

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BLOCKADE RUNNERS

Gray Ghosts Of The Confederacy

BY
RICHARD TRIEBE



photo/courtesy New Hanover County Museum

The Civil War blockade runner *Advance* is depicted in a watercolor by M.C. Higgins.

More than 40 of North Carolina's oldest shipwrecks are seldom visited, although their locations are widely known and most can be reached by making a simple shore dive. Sounds unbelievable, doesn't it? But wait, there's more. Many of the wrecks still possess much of their cargo (including guns, bullets, whiskey, etc.) and some are reported to even contain gold. The wrecks are those of Civil War blockade runners and the reasons they are overlooked as potential dive sites are as many and varied as the wrecks themselves. But, before we get into the whys and hows of diving them, let's look at their colorful history and how

some got to be where they are.

Shortly after the outbreak of hostilities at Fort Sumter, President Lincoln proclaimed a total Union blockade of 4,000 miles of southern coastline. The Confederates merely scoffed at the idea because they recognized the difficulties involved in enforcing a blockade of this magnitude. As a result the Confederate government was slow to react to Lincoln's proclamation. They falsely believed the secession would be peaceful and so they made no provisions for supplying a large, active army. When the first bloody battles showed how truly wrong they were, the private business of block-

ade running was firmly entrenched. As shortages of war materials developed, so, too, did shortages of necessities of everyday life. Soon it became apparent to shippers that enormous profits could be had by supplying the materials the South needed desperately.

Agriculturally the South was rich. It was one of the major producers of the world's cotton and it did not take long before foreign markets were clamoring for all they could get. Some of the shippers took advantage of this special situation and crammed their vessels to the gunwales with bales of cotton. When conditions permitted, they would sail to Bermuda or

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Nassau to trade for munitions, food, medicine and luxury items such as champagne, silks, brandy and cigars. Often they realized a return of 500 to 1,000 percent from these trips. The enormous profits involved made it possible for a shipper to pay for his vessel with two runs or even a single run through the blockade.

In no time at all the swift blockade runner took on a design all its own. Generally, she was a slender, low sidewheel steamer of about 350 tons. She was built of iron and had a length nine times her beam. The preferred color for the hull was a lead gray or a light cloud-like color that could hardly be seen in daylight at a few hundred yards. Anthracite coal, which made no smoke, was the most desirable fuel. On many such ships, the rakish masts and smoke stacks were hinged above the decks so they could be lowered, allowing the low profile to blend in perfectly with the sand dunes or the horizon of the sea.

Watching 4,000 miles of coastline seems an incredible task, and it was. It was made easier, however, by the judicious handling of available ships and the patrolling of certain harbors. Gideon Welles, then Secretary of the Navy, determined that only a few ports along the southern coast needed blockading. These were Norfolk, Virginia; New Bern and Wilmington, North Carolina; Charleston, South Carolina; Savannah, Georgia;

Pensacola, Florida; Mobile, Alabama; New Orleans, Louisiana; and Galveston, Texas. These ports were major Confederate shipping points with accessible deep-water harbors and reasonable connections by rail or river to the interior. Welles' plan was to seal off these vital harbors with two separate rows of ships. The first, or "inner squadron," was stationed five miles off the harbor entrance out of range of the Confederate batteries. The second, or "outer squadron," would patrol an arc 40 miles out to sea. The thinking was that if a blockade runner was sighted by the inner row and was successful in outrunning them, the outer patrol could be alerted and take up the chase.

For the most part blockade running was a cat-and-mouse, hide-and-seek game. The runner would wait until a moonless night with a rising tide, then race out along the shore. If he was lucky he avoided the inner row of the blockade. If he was not the Federal ship in pursuit would fire a rocket revealing his location and the direction of the chase. Soon the blockade runner's escape would be cut off by ships from the outer squadron. During the early years of the war this quite often turned out to be no great cause for alarm as the swift blockade runners usually outdistanced their pursuers. But, as the Union acquired more and more ships, running the blockade became increasingly difficult. Some of the

captured blockade runners were put into service chasing down their former allies. With their shallow draft and speed they were formidable adversaries.

Throughout the Civil War the shores of southeastern North Carolina claimed the highest concentration of wrecked blockade runners—more than 40 of them. The reasons such a large number was lost along this 80 miles of coastline are many. First and foremost is the port of Wilmington, North Carolina. It lies 28 miles up the Cape Fear River and was thus protected from direct enemy attack by sea. Here cargoes could be loaded or off-loaded without fear. Additionally, there were two approaches to the port. One was from the east, through New Inlet, and the other was farther south, through Old Inlet. The distance between them was only six miles but, because of Smith's Island and the treacherous Frying Pan Shoals, it was expanded to nearly 40 miles by sea. Thus, the Federals had two inlets to watch, separated by hundreds of shifting sandbars. In addition to these natural defenses, Forts Caswell and Fisher offered incoming vessels support from their guns. Fort Fisher was also the last Confederate fort to fall, which meant that Wilmington was the last major port open in the South. Another reason for Wilmington to be considered over other ports was because she was considerably closer to Virginia and Lee's beleaguered forces

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BLOCKADE RUNNERS

than either Charleston or Savannah. Every shipment landed meant the South could fight a little longer.

At the beginning of hostilities the value of the Confederate dollar was about equal with that of the gold dollar. As the war dragged on and the strangle hold of the Federal blockade tightened, the South grew more and more desperate for supplies. Gold then began selling at fantastic prices and Confederate currency was looked upon with increasing suspicion, its purchasing power shrinking each month. By December of 1864 the value of the Confederate dollar had slipped to an all time low. Two thousand dollars in Confederate notes were now required to equal one dollar in gold. As a result, foreign markets no longer accepted paper money and demanded gold instead. To meet this need the blockade runners started carrying the precious metal along with cotton to purchase their much needed supplies. Some British were sympathetic to the southern cause and donated substantial amounts of gold. This, too, was brought in through the blockade. As the war neared an end, and the Union blockade became truly effective and scores of blockade runners were wrecked when they ran up on the beach to avoid capture. Some of the vessels reported to contain gold include the *Condor*, *Fanny and Jenny*, *General Beauregard* and *Georgiana C. McCaw*.

So, now all the elements are present to create a shipwreck diver's dream: easy accessibility, a valuable cargo and a rich history. But, like the beauty of the rose, this type of perfect shipwreck contains a few thorns. One of these is that 90 percent of these wrecks lie in or near the surf zone. Because of this the visibility can be reduced to an average of three to five feet. However, by careful selection of the wreck and by choosing the times you dive, this can usually be overcome. By beginning your dive one-half hour before slack high tide, you can increase visibility from four to six feet. In addition, the surge is often greatly reduced at this time. On most wrecks two different visibilities can be found. Near the surface, 10 to 12 feet is not uncommon, but near the bottom it might drop to 3 or 4.

Generally, visibility is best in inshore waters in early spring or mid to late summer. Northeast or east winds can also influence the visibility by bringing in the clearer offshore water. Although these same conditions quite often produce increased surge, it is possible to catch things just right when the wind changes direction or dies down.

Also, be aware that if you dive from shore you must pass through a very turbulent surf zone. Because of the surge and abrasive, coral encrusted wreckage, gloves are a must. Also, the use of a thin

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wetsuit or old shirt and jeans is encouraged as added protection.

All of these wrecks may be visited without a permit but, because they are within state waters, North Carolina claims ownership. A permit is required if anything is to be salvaged.

Because gold was guarded with the utmost secrecy, we shall never know just how many vessels carrying it were wrecked. We do know of three and possibly four. Although their locations are well known, the gold has not been found.

THE CONDOR

The first of these wrecks is the sleek sidewheel steamer *Condor*. The *Condor* was the ultimate blockade runner of her day. She was 300 tons, 270 feet long, had a beam of 24 feet and was equipped with three short smoke stacks and two masts. She looked fast and she was. In a fair sea she could cruise at 15 knots and if hard pressed she could attain an



photo/courtesy Library of Congress

This photo, taken in 1865, shows the wreckage of an unknown blockade runner off Sullivan's Island, South Carolina.

amazing (for her day) 18 knots. On the morning of September 7, 1864 the *Condor* departed Halifax, England for the port of Wilmington, North Carolina. On board was the notorious female spy, Mrs. Rose Greenhow, and in her possession she had nearly 400 gold sovereigns to aid her beloved Confederacy. As is always the case, the strictest of secrecy was observed and no one on board knew of the gold but Mrs. Greenhow.

The *Condor* arrived off New Inlet an hour before dawn on October 1 but was sighted by the USS *Nippon*. A chase ensued but in the *Condor's* flight to avoid capture the pilot mistook the stranded blockade runner *Night Hawk* for another Federal gunboat. He swung to starboard and in a few moments was hard aground on the treacherous shoals to the right of the channel.

Fearing being caught as a spy, Mrs. Greenhow asked the captain to send her ashore in a boat. She was advised the sea was too rough and that she would be perfectly safe if she remained on board until the conditions moderated. She was still adamant and the captain, not knowing what else to do, finally relented. She was put in a lifeboat along with the pilot and three others and lowered away. The little boat only had 100 yards to travel but

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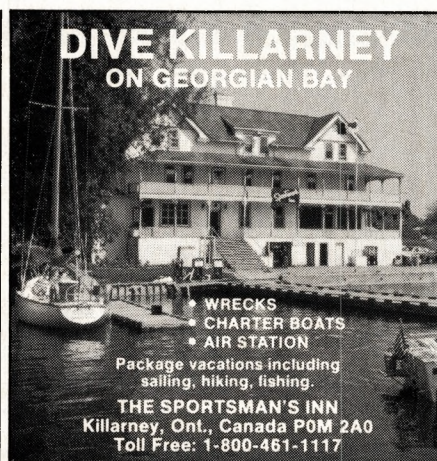
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BLOCKADE RUNNERS

somewhere between the stranded blockade runner and shore she capsized, spilling her precious cargo into the surf.

Two hours later Mrs. Greenhow's lifeless body was found by a lone sentry after it washed up on the beach. Around her neck she wore a leather bag containing 100 of the gold sovereigns. Upon learning what the bag contained the soldier quickly secreted the coins in his pockets. Soon word circulated as to the identity of the victim. When the soldier found out who it was he had robbed he was so filled with remorse that he ran to Fort Fisher and confessed.

The story accounts for 100 of the British sovereigns, but what happened to the other 300? My guess is they are scattered on the sandy bottom somewhere between the *Condor* and the shore.

THE FANNY AND JENNY

Another tale of lost gold surrounds the stranding of the sidewheel steamer *Fanny and Jenny*. On the morning of February 9, 1864 the runner was headed for Wilmington in heavy seas when it was spotted by the USS *Florida*. The *Florida* began firing her 12 pound howitzers and forced the *Fanny and Jenny* to hug the shore. In a short while she ran aground just north of Masonboro Inlet at Wrightsville Beach. In a desperate attempt to get away the crew abandoned ship and pulled for shore. One of the boats capsized and the captain and his paymaster were drowned. Also lost was a quantity of gold sovereigns and a valuable gold, jeweled sword to be delivered to General Robert E. Lee as a gesture of admiration from British sympathizers.

THE BEAUREGARD

The third treasure was shrouded in secrecy and because there is a lack of documented evidence it may or may not exist. In doing my research for this story I ran across an account that stated there may have been a chest of gold coins aboard the *General Beauregard*.

Shortly after dark on December 11, 1863 the *Beauregard* was spotted by the USS *Howaquah* as she made her run for New Inlet and safety. She was battling a heavy sea and coming under fire from the guns of the *Howaquah* when she turned and ran toward shore, going aground off Carolina Beach. Despite a powerful surf the captain and crew got ashore safely.

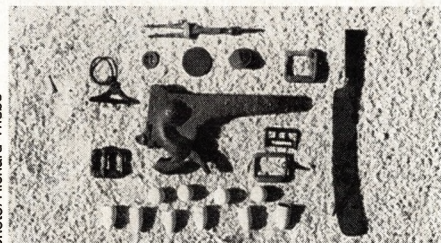
During the night Colonel Lamb at Fort Fisher received word of the stranding and by morning had placed a small battery of Whitworth guns in a natural sand dune bastion a few hundred yards from the stranded vessel to protect it.

Early the next morning two Federal gunboats, the *Howaquah* and *Tuscarora*, steamed in close to shore in an attempt to pull the stranded *Beauregard* free and take her as a prize. Colonel Lamb let the

gunboats move in as close as he dared, then fired upon them with his Whitworths. The Federal cruisers received such terrible damage they withdrew immediately. The *Tuscarora* was out of service 14 months. The *Howaquah* limped a few miles out to sea and sank.

Because of her exposed location and the resulting military standoff the *Beauregard* was never salvaged. Her cargo, as near as I can figure, consisted of cotton, resin, turpentine and possibly a chest of gold. The gold presumably was secreted aboard the vessel by the captain and another seaman. It was left on board in their haste to escape and was to be salvaged later.

To this day the remains of the *General Beauregard* can be seen during low tide off Carolina Beach. The wreck, in 20 feet of water, sits upright on a sand bottom




photo/Richard Triebe

Artifacts recovered from the wreck of the *General Beauregard* include mini and musket balls, a knife, fork, buckles, buttons and the hammer mechanism for a musket.

with four to five feet of her gunwale exposed. Her metal paddlewheel hubs and machinery provide the wreck with 18 feet of relief. Her sides are made of iron and the remains of a wooden deck lie scattered about. Because of her shallow depth and the exposure to sunlight, a heavy growth of coral and sponges exists. Marine life abounds on the wreck and at times it is impossible to get a clear view because of the swarms of colorful fish. Fanning the sand in and around the wreck could produce an artifact or two. To date the *General Beauregard* has produced a few musket balls, some buttons and a hammer mechanism for a musket.

THE GEORGIANA C. MCCAW

The last tale of gold concerns the side-wheel steamer *Georgiana C. McCaw*. She was discovered by the USS *Victoria* on the morning of June 2, 1864 as she raced for the entrance to Wilmington. Although the blockade runner was within easy range of Fort Caswell, she struck the shoals and settled in ten feet of water. The pilot did not immediately set out for shore as did the rest of the crew. Reportedly, there was a quantity of gold aboard and he stayed behind to secure it. When a small boat returned later the captain was found with his skull crushed. No trace of the gold could be found. What could have happened? Who might have killed the pilot and how was he able to escape unseen? Rumors say that the gold is still aboard but well hidden. 

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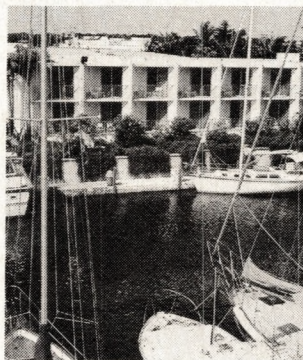
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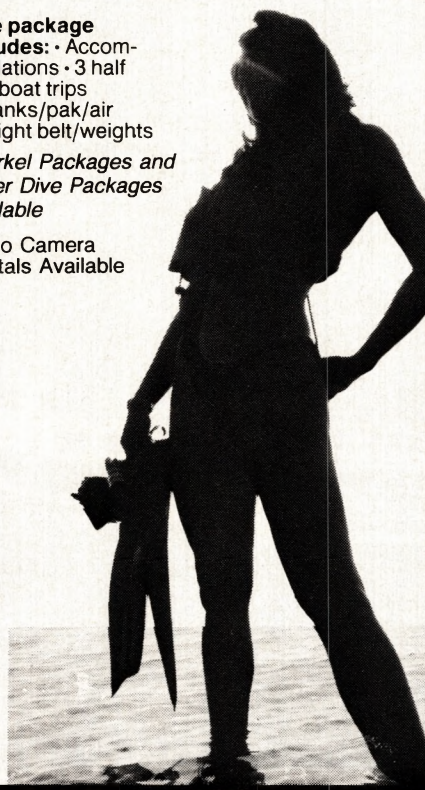
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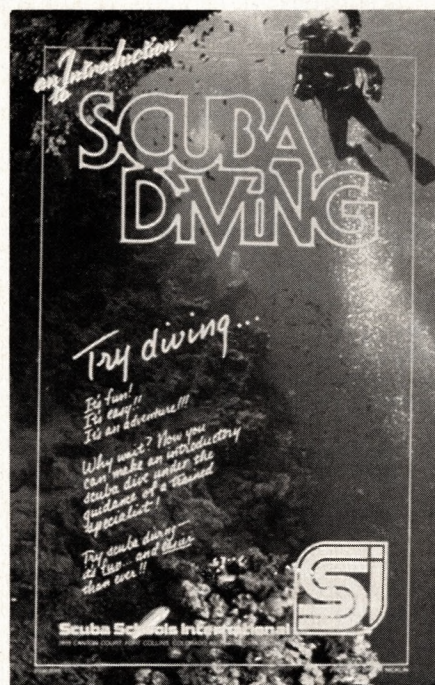
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SSI UPDATE

SSI (Scuba Schools International) instructors has four new programs. One, a placement program, will help instructors to find teaching jobs in diverse communities around the world. This program matches instructors with jobs in much the same way as a university career placement service. Instructors merely establish a credentials file at headquarters, which is shared with owners seeking new staff. The instructor's file is active for six months and screening applications and arranging interviews is accomplished at the discretion of the store owner.



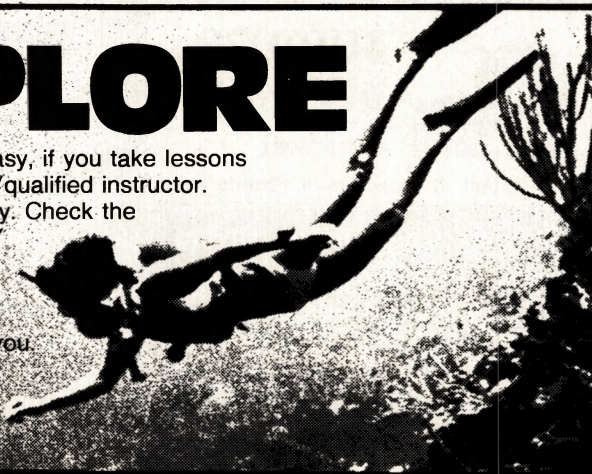
The second program allows resort operators to become associate members of SSI. This limited membership entitles resort owners to tap into the SSI worldwide referral network and serve the thousands of SSI divers who visit such resorts to complete open water training or just for vacations. Resort members can conduct open water training, scuba skills update, introduction to scuba and snorkeling.

This new membership program has many benefits. Resort owners can now access SSI products not offered to non-members, get free publicity and promotion through SSI publications and easily upgrade to full membership, if appropriate. The third program is introduction to scuba. It takes would-be divers through the basic steps of diving—building in comfort, relaxation and fun. It's an action packed minicourse that takes beginners to the pool or open water immediately, without the expense or commitment of a full length course. Best of all, viewing a short videotape increases comfort levels by preparing new divers for the underwater environment. Participants in the mini-

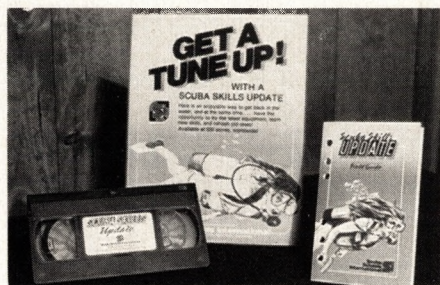
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Learning to dive is easy, if you take lessons from an experienced/qualified instructor. Enroll in a class today. Check the **DIVERS DIRECTORY** in the back of this magazine to find the dive store and instructor closest to you.

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course take home an informative brochure and a colorful diploma in addition to delightful memories of their first underwater adventure.



Scuba skills Update is the fourth new program, which allows divers to get back in the water with comfort and convenience. Whether divers want to practice assembling their gear or to polish up their diving techniques, this brief program will cover all the bases. Participants can even use scuba skills update as a home study course—reading and watching the video in the comfort of their own living rooms.

The program is built around a 25 minute videotape, shot in the Bahamas.

For information on any of these programs contact SSI at (303) 482-0883 or write 2619 Canton Court, Fort Collins, CO 80525.

NAUI ADVANCED DIVING TEXTBOOK

An advanced diving textbook has been published by NAUI. This new work contains the writings of dozens of experts and is more than just a support publication for advanced diver training. The new NAUI text contains comprehensive chapters on the primary subject areas of diving: physics, physiology, equipment, environment and decompression. The information goes far beyond that of an entry level text, providing the knowledge base required for leadership level understanding. An excellent feature of these chapters is that hundreds of diving terms are identified in capital letters and defined in the text as well as in a glossary. Information about recompression chambers, dive computers and other important topics not commonly addressed in currently available diving texts are also contained in NAUI's new book.

Another feature of the new publication, entitled *Advanced Diving Technology and Techniques*, is orientation information on many advanced and specialty diving activities. Topics that might be expected—such as navigation, night diving, search, light salvage and deeper diving—are included, but so are topics such as river diving, drift diving, videography and dry-suit diving—information which is not readily available in other diving texts.

Advanced Diving Technology and Techniques is available from NAUI Headquarters, P.O. Box 14560, Montclair, CA 91763 or contact any NAUI facility.

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AFTER THE RESCUE COURSES

Pro Dive of Ft. Lauderdale, Florida now provides diving emergency medical education programs to the recreational diving industry. These programs are designed for instructors, boat captains/crew and other diving professionals who are responsible for other divers. The courses are designed to help develop the needed skills to handle all aspects of a diving emergency, before and after the rescue. There are three courses available including: Diving Accident Management Specialist (DAMS), Basic Diver Medical Technician (DMT) and Advanced Diver Medical Technician (ADMT).

The DAMS course is designed for non-medical professionals, mainly diving instructors and dive boat crews. This five day course will provide participants with theory and practical applications every diving professional needs to better handle an accident. Rescue diver certification is the minimum prerequisite for this course as topics and practical sessions for this program begin where the rescue course leaves off.

DMT/ADMT programs are geared for police or rescue dive team personnel, dive boat captains, diving operation directors and medical personnel—generally diving professionals specializing in emergency response and rescue or those placed in a position of directing a rescue. EMT and diver certification is the minimum course prerequisite, as these programs deal with many advanced aspects of medical treatment.

Nurses and paramedical personnel are eligible for CEUs at the completion of the programs. Certifications are issued by the National Association of Diving Medical Technicians (NADMT).

The instructor for these courses is Dudley Crosson, Ph.D. Dr. Crosson is a certified instructor with the National Association of Diver Medical Technicians.

Dr. Crosson will conduct the DAMS course on a regular basis at Pro Dive, Ft. Lauderdale. Course dates are: May 8, June 12, July 17, August 21, October 2, November 6, December 18. The DMT and ADMT courses are scheduled on an as needed bases.

To receive a complete catalog describing the above mentioned programs, contact William Cline, Training Director, Pro Dive, Bahia Mar Yachting Resort, 801 Seabreeze Boulevard, Ft. Lauderdale, FL 33316. You can call (800) 772-DIVE (3483) or, in Florida, (305) 761-3413.

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Matagi is one of Fiji's most secluded and idyllic islands, a lofty 240 acre majestic formation rising out of waters un-

surpassed for their marine life and beauty. Intimate, with a limited number of bures (bungalows), the Matagi Island Resort couples fresh food and deluxe accommodations with an island lifestyle rich in traditions of hospitality. Matagi Island forms a horseshoe around a submerged volcanic crater with fringing white sand beaches. The rainforested interior offers mountain hikes, bush walks, caves, coves and secluded grottos.

On Matagi, guests are part of the Douglas family—a family with a tradition of hospitality and a reputation among divers. PADI qualified divemasters, new equipment and a 42 foot cabin cruiser dive boat ensure the best for guests. The island is just six miles off the coast of Tavenui with daily flights from Nadi International airport and Suva.

For more information and a color brochure contact Matagi Island Resort, P.O. Box 83, Waiyevo, Tavenui, Fiji Islands; telephone (87) 260. The U.S. contacts are Adventure Express Travel at (800) 443-0799 and Tropical Adventures at (800) 247-3483. 🐠

LAHAINA BOAT

The *Endeavor*, Lahaina Divers newest vessel, has arrived in Maui. The 50 foot fiberglass molded boat was built by Westport Shipyard and is powered by twin 450 horsepower engines. The hull is constructed of airex foam core with fire retardant fiberglass finish.

Designed specifically to meet the demands of the Hawaiian dive industry, the fast, comfortable *Endeavor* has many outstanding features including custom boarding ladders, wide swimstep, full stern doors, deck shower and ample gear storage. The boat is Coast Guard certified for 45 passengers although Lahaina Divers limits charters to 24 divers.

For more information contact Lahaina Divers, 162 Lahainaluna Rd., Lahaina, HI 96761; (808) 667-6280. 🐠

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Are you an active, teaching scuba instructor? Have you ever wished you knew more techniques for the actual problems that arise while teaching? If so, the WADE program could be just what you are looking for. WADE (Workshops in Active Diver Education) is a series of technique workshops for scuba instructors and diving educators. It will discuss actual scenarios that occur while teaching and give you strategies to cope with them. Printed excerpts from the workshops will be made available at minimum printing cost.

The first workshop will be held May 7 in Los Angeles, California. Contact Kingfish, Inc. for more information, 957 Oliver Street, San Pedro, CA 90731; (213) 548-4183. Enrollment is \$25. 🐠

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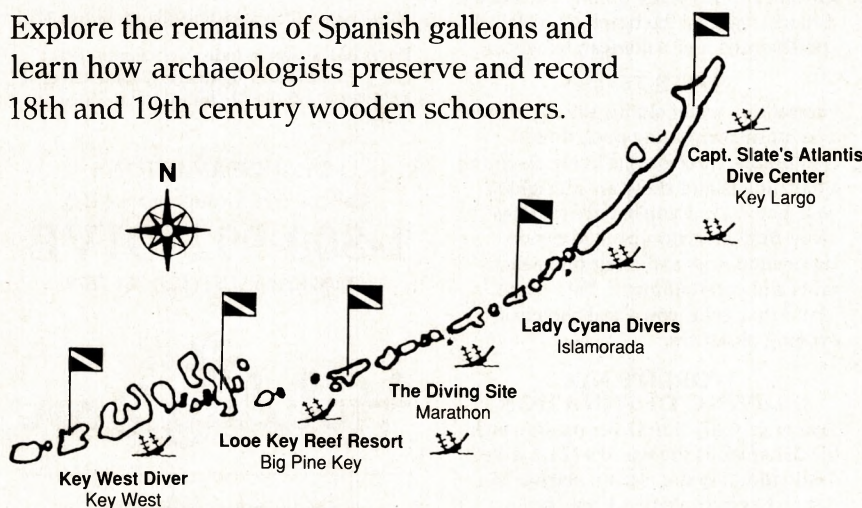
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NIKONOS COURSE

(Continued from Page 11)

depend on the following factors:

- 1) Obtaining the correct exposure
- 2) Avoiding backscatter
- 3) Obtaining maximum color saturation

Obtaining the correct exposure with total flash technique is fairly simple. Set up both the camera and strobe for TTL operation. Make sure the background ambient light does not overpower your TTL aperture setting. Estimate the camera to subject distance and calculate the correct f/stop for that distance.

Avoiding backscatter is achieved by holding the flash off to one side so light (from the strobe) striking particles in the water is not reflected back into the lens. Almost all bodies of water have tiny particles floating in suspension. These can be sand, plankton, rust (from wrecks) or even micro air bubbles. By aiming the strobe at a 45 degree angle to the axis of the lens much of the particle reflection will be eliminated.

Obtaining maximum color saturation is achieved by reducing the camera to subject distance to an absolute minimum. Light from the strobe travels first from the strobe to the subject and then back to the camera lens. This is known as the total light path. All the way along this path, the water filters out the warm colors. When you photograph a subject three feet from the camera, the light must travel through six feet of water—thus losing much of its red. Fortunately, the wide angle lens allows you to get very close to the subject and still fit everything into the picture.

SUBJECT SET-UP

While TTL flash mode allows you to shoot perfect exposures automatically, underwater conditions have to be right. There are several situations where TTL will not work and manual flash is preferable. These exceptions will be covered in the next lesson. For now, devote your efforts toward total flash with TTL.

It is best to begin your TTL flash photography 20 feet or deeper. This will help ensure that the ambient light does not overpower your f/stop. The background must be darker than your aperture setting or the picture will be overexposed.

Another way to help keep the background dark is to aim the camera down, or at the very least aim it horizontally. Aiming the camera up is likely to cause an overbright background.

Position camera and strobe as close to the subject as possible. The subject should fill the viewfinder frame or at least 50 percent of it. The Nikonos V TTL system depends on reflected light (from the subject) to make its electronic calcula-

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tions. It contains a center weighted light meter that measures the light coming from the central area of the picture. It can only perform correctly when the subject is in the center of the picture and is large enough to reflect a sufficient amount of light, representative of the situation.

Another benefit of getting close to your subject is richer colors. The closer the subject, the less color filtration by the water in between. It is not unusual to shoot wide angle photos at 1.5 to 2.5 feet. At these distances, your pictures will sparkle with rich reds, oranges and yellows.

TTL OPERATION

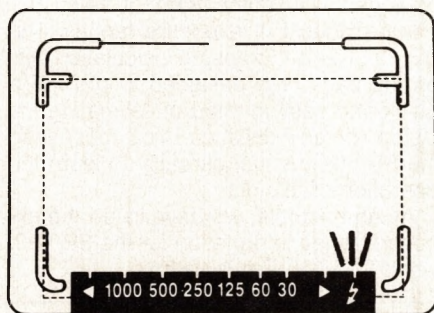
In a total flash situation, the TTL circuitry operates in a fairly simple manner. When the shutter release button is depressed, the strobe fires. Light from the strobe travels to the subject and is reflected back into the camera lens.

The aperture controls the amount of light that travels to the film. A flash sensor measures the amount of light striking the film plane and shuts off the strobe when sufficient light has reached it. This cutoff happens at a speed that boggles the mind—a fraction of 1/1000 second!

The TTL system automatically compensates for subject reflectivity and variations in distance. The trick is to select an aperture that allows enough light to reach the film for a proper exposure, yet is small enough to ensure image sharpness and good depth of field. TTL can cut off excess light but it cannot increase light if the aperture is too small.

The TTL system will warn you if there was insufficient flash for a correct exposure. The flash symbol (lightning bolt) in the viewfinder display window will start

VIEWFINDER



**TTL
Underexposure Warning**

blinking immediately after the flash has been fired. And, on the SB 102 strobe, the ready light will also start flashing. These warning signals mean correct exposure has not been achieved and you should move closer to the subject and repeat the shot.

CAMERA/STROBE SETTINGS

Before entering the water, you should set up your camera and strobe for TTL

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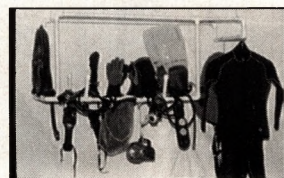
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NIKONOS COURSE

operation. The basic camera settings should be as follows:

- 1) Film speed dial set at ISO 100
- 2) Frame counter on number 1
- 3) Shutter speed dial on "A" for automatic exposure
- 4) Focus set on three feet (to be adjusted U/W)
- 5) Aperture set on f/8 (to be adjusted underwater)

Be sure to preset all of the SB 102 controls for TTL operation as well:

- 1) Power switch set to On
- 2) Mode switch set to TTL
- 3) Slave switch set to Off
- 4) Ready light glowing red
- 5) Diffuser attached to front
- 6) Flash calculator dial—ISO 100 opposite the W and fish symbol.

You may wish to test fire your strobe to check camera and strobe function. In order to do this, point the camera and strobe at a large reflective surface no more than three feet away.

THE RIGHT F/STOP

Selecting the right f/stop is the key to successful TTL flash. You want the aperture to be as small (toward f/22) as possible for image sharpness and depth of field. Yet the aperture must be large enough to allow the TTL circuitry to function. How do you choose the right f/stop?

Since all other controls are preset on automatic, the correct f/stop is dependent upon the distance between your camera/strobe and the subject.

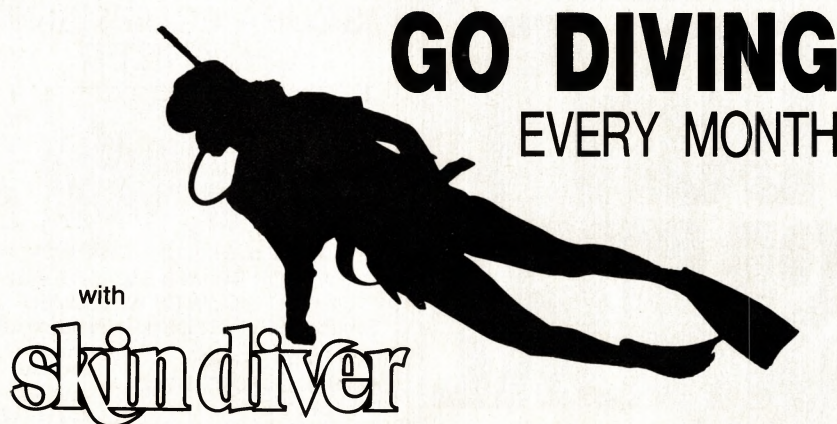
Most underwater TTL strobes are equipped with some form of calculator that provides TTL exposure ranges. The SB 102 has an Exposure Calculation Dial on the back. It is designed to provide a quick and easy method of estimating the f/stop for any distance. You must read the SB 102 manual carefully to learn the operation of this dial.

As an example, we have listed the exposure range information for the SB 102, when ISO 100 film is used:

SB 102 STROBE TTL SHOOTING RANGE*

Distance Range (feet)	F/Stop Setting
1.0—1.6	f/22
1.0—2.3	f/16
1.0—3.3	f/11
1.0—4.6	f/8
1.0—6.6	f/5.6
1.6—9.2	f/4
2.3—13.0	f/2.8

* Based on SB 102 with diffuser adapter, set on TTL and using ISO 100 film.



It is important to remember that the TTL automatic exposure system can *subtract* light from the flash output, but it cannot add light. Only the aperture can add light (use a larger aperture).

Once you have estimated the camera to subject distance and set the aperture, take your shot and immediately check the ready light on your strobe. If it is flashing, it means there was insufficient light for correct exposure. If this is the case, adjust your aperture to the next larger f/ stop and try again.

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BRACKETING TTL EXPOSURES

There are situations in which TTL can be fooled because of the extreme reflectivity (or lack of it) in the subject. For example, it is difficult to shoot a TTL flash picture of a diver clad in a black wetsuit. The black suit does not reflect much light and the strobe, attempting to light this black subject, ends up overexposing the diver's face and hands.

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by bracketing your exposures. Bracketing involves shooting three pictures at three different exposures—one overexposure, one correct exposure and one underexposure. For example, if the calculated exposure is an f/8, you would shoot one picture each at f/5.6, f/8 and f/11.

How is it possible to bracket exposures with a totally automatic TTL system? By adjusting the film speed dial rather than the aperture. It creates the same effect.

If you are using ISO 100 film, you can achieve a three f/stop bracket by shooting three different pictures at ASA/ISO dial settings of 50, 100 and 200. One of the three exposures should be correct, regardless of the subject's reflectivity.

NIKONOS SHOOTOUTS '89

If you would like to meet other divers who have deep interest in underwater photography, and also attend Nikonos photo lectures by the pros, you may wish to attend one of the four Nikonos Shootouts scheduled for this year:

April 29—May 6	Cayman Brac
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AVOIDING BACKSCATTER

One of the major obstacles to shooting U/W flash pictures is a phenomenon known as backscatter. Instead of getting a clear, brightly lit photograph, backscatter causes an underexposed picture with a snowflakes in a blizzard effect.

The "snowflakes" are caused by reflections from tiny particles floating in the water between the camera lens and the subject. These particles are commonly described as turbidity.

Underwater turbidity can be caused by a variety of particles including: sand, plankton, algae, rust (from wrecks), mud, micro air bubbles or other organic matter. These particles are almost neutrally buoyant and thus float in the water, easily moved by the smallest currents.

There are two things you can do to avoid backscatter or reduce it to a minimum. Both steps can greatly improve your underwater flash pictures.

The first and most important thing to do is recognize and avoid turbidity whenever possible. As you prepare to shoot your

picture, carefully examine the water column that lies between your camera lens and the subject. If there is an excessive amount of sand or other particles in the water column, move to another area where the water is clearer.

When shooting pictures underwater, take special care not to stir the bottom with your fins or hand movements. Also, check the water column for micro bubbles caused by diver exhalation. If you see any, wait a few moments for these slow moving bubbles to ascend out of the picture area.

The other thing you can do to reduce backscatter is hold or position the strobe to one side. If the axis of the strobe is at a 45 degree angle to the axis of the camera lens the strobe light hitting these tiny particles will be reflected away from the lens. The strobe light will still illuminate the subject, but backscatter will be eliminated or greatly reduced.


The strobe can be positioned to one side (usually the left) to achieve this 45 degree angle. The Nikonos SB 102 flash handle is specifically designed to accommodate this positioning.

CHECK LIST


We have covered a great deal of information in this lesson. You may wish to re-read the material a couple of times before attempting TTL flash underwater.

Let us summarize the high points of this lesson:

- 1) Set your camera on A for automatic
- 2) Set your strobe on TTL
- 3) Work deeper than 20 feet
- 4) Point the camera horizontally or down
- 5) Get close to your subject
- 6) Position your subject in the center of the picture
- 7) Bracket your exposures with the film speed dial
- 8) Hold the strobe off to one side to avoid backscatter

It will help to review this procedure just prior to going into the water. Flash can add an exciting dimension to your wide angle photography and TTL will make it easy. 

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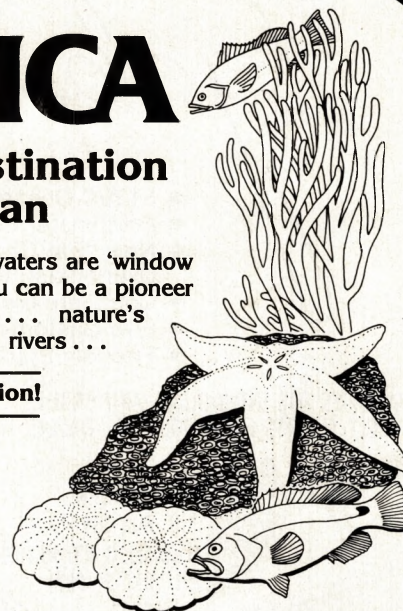
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TECHNIFACTS

(Continued from Page 29)

cent coin. This *Bounty* was the first vessel ever built solely for making a movie. U/W photographer Luis Marden dove down to the original *Bounty* at Pitcairn Island and recovered a spike from that vessel that was driven into the keel of my *Bounty*. She was used to make the film *Mutiny on the Bounty* starring the late Trevor Howard and Marlon Brando. I served on her as radio officer. This is the vessel that is the tourist attraction in Miami, FL."

The fourth *Bounty* (the third replica) was built in Whangarei, New Zealand. According to Spud, "She was built for the movie *Bounty* starring the Australian actor Mel Gibson as Fletcher Christian and Anthony Hopkins as William Bligh."

At the risk of being scuttled I am going to ask: Where lies this fourth, and hopefully last, *Bounty*?

SEPTEMBER CONFERENCE

There is a meeting scheduled in Fort Collins, Colorado that you might want to attend. The International Association of Dive Rescue Specialists, Inc., will hold its annual conference, Dive Rescue—1989, September 17-20. Beverly Yarber wrote, "We will be offering information intensive lectures, demonstrations and workshops. Topics include Stress Management Techniques for the Public Safety Diver by Corporal Bob Teather; Creating and Maintaining Optimum Press Relations by Russell Baker; Dive Team Management by Jack Snook; and The Latest in Diving Medicine by Dr. Brian Foley."

There will also be an equipment fair with the latest in sidescan sonar, video equipment and protective gear on display. I will be on hand to address the awards banquet on Tuesday, September 19. If, in addition to an excellent conference, you would like to see a film and hear some tall tales about my diving (some small amount as a rescue and recovery diver) meet me at the conference.

For information, write or call Beverly N. Yarber, International Association of Dive Rescue Specialists, 2619 Canton Court, Fort Collins, CO 80525; (303) 482-0887.

ENVIRONMENTAL THOUGHTS

Each of the five billion human beings on earth must become a thoughtful and caring environmentalist if the outrage against planet earth is to be turned around. Sometimes it isn't what we do but what we don't do that makes the difference. Being careful not to pollute is equally as important as restoring a polluted environment. The millions of sport divers who enter the water must make extra efforts to preserve all aspects of their playgrounds. When you leave a dive site, the next visitor to that habitat should not be able to tell anyone else has ever been

there. In several areas there are regulations about not anchoring boats in coral gardens. Just as much damage can be done by anchors and chains in other areas—productive shell beds or kelp gardens, for example.

Rivers and fast flowing creeks can also be adversely impacted by the actions of mankind. Every major river in the United States has now been changed irreversibly by the construction of dams. Obviously, some short range benefits are derived. It is beginning to be recognized that there may well be long term adverse environmental problems when fast flowing streams are turned into nearly stagnant ribbons of turbid water.

Some streams that are not dammed are also experiencing stress. The Grande Ronde River in northeastern Oregon is a stream that I "adopted" many years ago. Periodically I make float dives in selected areas of the stream. I have watched this crystal clear stream become one that is festooned with algal growth, beset by muddy incursion from irrigation water, and seepage from cesspools and farm outbuildings. The once shiny rocks serving as habitats for trout now share the stream bed with cans, plastics, car bodies and other trash.

There are many such streams and lakes. Some of these have been "adopted" by dive clubs that periodically conduct outings to clear the trash left by careless and uncaring visitors. It seems to me that divers as individuals and, particularly, dive clubs, could adopt a body of water, be it a lake, river, bay, piece of the ocean or a tide pool, as their own small but important part of planet earth to be patrolled, policed and given a lot of tender, loving care. It will be rewarding to you and to your planet. Do it. You will be glad you did!

HOLSTON TO STATE TOURISM BOARD

Key West dive operator Bob Holston has been appointed to the Florida Department of Commerce's Tourism Advisory Council by Lieutenant Governor (and Secretary of Commerce) Bobby Brantley. Holston, who has owned and operated Key West Pro Dive Shop since 1972, will serve a four year term that expires at the end of 1992. The council, comprised of 37 private sector tourism industry professionals, provides the Florida Division of Tourism with a variety of perspectives on visitor marketing. The committee meets four times a year at different locations throughout the state.

Holston also serves as director of the annual International Dive and Travel Show in Orlando and is a member of the Key West Chamber of Commerce and Keys Association of Dive Operators. He and Islamorada hotelier Joe Roth are the only representatives to the Tourism Advisory Council from the Keys.

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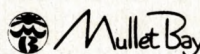
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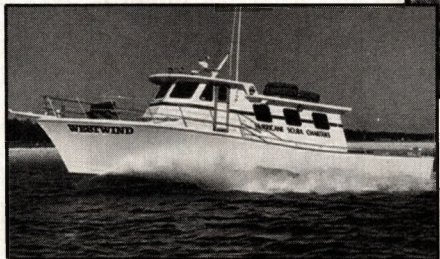
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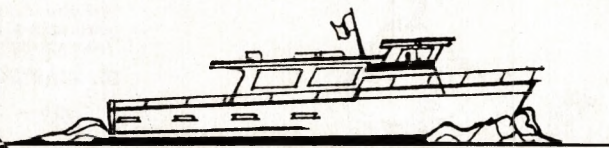
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FLOATING IN OIL

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BY JOHN BEALS

I tended the OSHA hose standing on a small, steel railed grate suspended in a vast cathedral half filled with Nigerian crude oil. Slacking Kurt's hose and watching him sink under the inky crude while wearing four life preservers, I said to myself: "It's going to be a long night."

And it was. My logged time on this dive was midnight to 10:00 the following morning. The bald statement in my log-book: "go to bottom of crude oil cargo tank and open stuck valve," belies the learning three divers would experience that rainy night on the Mississippi River.

Kurt, Tom and myself were working for a New Orleans dive company when we were called to the shop. The call-up had come from a tanker terminal company on the Mississippi River. It had a 1,000 foot Greek tanker almost off-loaded and a broken valve prevented emptying the final cargo tank.

Aware of the urgency, we quickly loaded the van with our standard dive gear: two compressors, diesel and gas, two 300 foot umbilical hoses (called OSHAs because they conform to Occupational Safety and Health Administration standards), a volume tank with whips (short hose connections), radio with spare battery, line and a 10 foot aluminum ladder.

As well as our personal bandmasks, we had a Desco pot: an old copper air helmet the company had just for the purpose of diving in foul and dubious liquids where you'd want to keep your ears dry.

Kurt, lead diver that night, took his oldest wetsuit, intending it to be expendable. Tom, stand-by diver, also took a wetsuit. I didn't take my personal gear as I would be tender for this dive.

Arriving at the tanker terminal and finding we had to hand carry the gear over a long, narrow catwalk, we left the work-horse diesel compressor in the van and took only the light, back-up gasoline compressor with its small volume tank.

Our equipment and gear onboard, we were led to the bridge and the captain. He explained, in heavily accented English, that haste was imperative. His ship was almost off-loaded when a long valve stem called the vertical torque road broke off. This rod extends from the valve on the bottom up through the tank, through the deck to a handwheel, which is turned to open or close the valves. If we could open that valve, he and his crew could finish off-loading and be home for Christ-

mas. He would give the diver, Kurt, a \$500 bonus if he could do it tonight.

Kurt, highly motivated, said "Let's go" and went to change out. Anticipating oil burns, he smeared petroleum jelly over himself before donning his wetsuit.

I had the dive station set up. An entry port in the three football field expanse of the deck and a short, steel ladder led through the roof of a cathedral-like tank to a platform perched in its rafters. From the platform, the shadowy expanse of the cargo tank, with 34 feet of Nigerian crude still in it and lit by flickering emergency lights, stretched into the gloom.

I'd tied the dive ladder to one rail of the platform. The umbilical was coiled on the grating at my feet, the radio was tied to the top rail beside the ladder.

Kurt wore his petroleum jelly, his wetsuit, no coveralls (old wetsuit not worth protecting) and no weightbelt. He wanted to be buoyant and swim a line to the valve stem 125 to 150 feet away.

With my "ready" tap on the top of the hardhat, Kurt gave me the thumb up sign and descended the ladder. He let go of the ladder and sank like a rock. So much for the buoyancy of the wetsuit alone.

Since he was on the bottom, Kurt tried walking to the valve. He bumped into a barrier: what felt like steel bracing or knees that he was unable to clamber over. He came back under the dive ladder following my strain on the hose.

I heard the air compressor begin to sputter and misfire. Tom took the hose and I went on deck to find it raining and grounding out the compressor's spark-plug. Returning to station, I told Kurt I was bringing him up. That's when I learned how heavy he was in oil. My hands, lubricated with oil, just slipped on the hose; I couldn't lift him off the bottom.

Nervous, I sent Tom on deck to try to keep the compressor running, pushed "talk" on the radio and told Kurt my problems. Kurt, cool as a sea cucumber, said, "dog the hose." I took a round turn on the railing with the hose and Kurt came 25 feet up by placing his hands between the seizings and pulling himself up the umbilical. As Kurt's helmet appeared at the base of the ladder I thought: This is one dive where you wouldn't want to be using scuba.

We rigged a tarp over the compressor to keep the rain off and tried again. This time Kurt wore four life jackets for buoyancy, two under each arm. Again he sank, but I was ready and quickly dogged the hose.

Now the crew of the tanker came up with a two man inflatable liferaft. Kurt, with dollar signs for eyes, was still game, so we managed to get him and the raft into the crude. The raft half-sank, but it did float. Kurt, paddling furiously, reached a point about 40 feet from the ladder and just couldn't gain any more headway; the weight of the heavy OSHA hose acted as

(Continued on Page 184)

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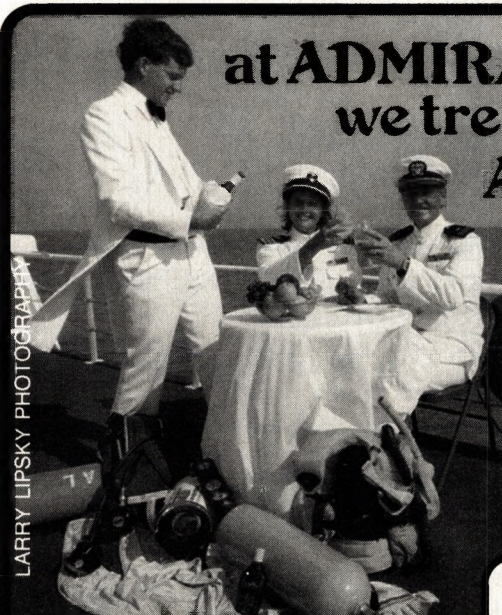
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COCONUT HARBOUR

(Continued from Page 143)

ting straight up from a sloping drop-off. It is at a depth of 90 feet and has a small tunnel passing through the center. **Orange Canyon** is a nearby drop-off marked by a coral canyon filled with colorful orange elephant ear sponges. The best diving is found at depths of 75 to 90 feet. **Bonnie's Arch** is a natural coral bridge that forms a giant U/W archway 50 feet in diameter. The arch is a favorite haunt for a small school of tarpon and depths range from 30 to 60 feet.

Trinity Caves is a dive site that must have been named by a dive guide suffering from narcosis. The caves are actually long narrow coral canyons that turn into tunnels as they reach the edge of the drop-off. The passageways converge at the face of the drop-off in approximately 100 feet of water. **Sand Chute** is a 300 foot wide sand canyon that slopes gradually to 130 feet where it continues over the edge of the wall. The white sand resembles a ski slope and the vertical sides of the canyon are loaded with sponges and coral formations.

Aquarium is a favorite fish feeding station in 40 to 50 feet of water. Residents of this reef include tame angelfish, sergeant majors and yellowtails. The wreck of the **Oro Verde** lies on her side in 50 feet of water. This 184 foot steel hulled wreck has become a haunt for a 110 pound jewfish, a pair of tame angelfish, a friendly barracuda and a school of horse-eye jacks. There are many more popular sites on the West Side, including: **Round Rock, Eagle's Nest, Texas Hole** and **Royal Palms Ledge**.

NORTH WALL SITES

The North Wall is world renowned for its crystal clear water and vertical drop-offs. Quabbin is able to dive this region conveniently by basing one of its dive boats at Governor's Sound. Instead of sailing around the northwest corner of the island, the dive boat takes a short cut straight through the middle of North Sound and out the barrier reef pass. The trip takes less than 30 minutes.

One of the most famous dive sites of the North Wall is **Tarpon Alley**, a long narrow coral canyon filled with a school of more than 100 giant tarpon. The great silver fish seem to enjoy the refuge of this canyon and lazily mill about as visiting divers swim through their midst.

Inshore from Tarpon Alley is one of the world's best 12 foot dives. **Stingray City** has recently gained fame for its community of 15 to 20 tame stingrays. These creatures can be handled by Quabbin's divemasters while guests take photos and videos at close range.

HOW TO GET THERE

Getting to Grand Cayman is one of the easiest and most convenient trips you will ever make. The island is only 485 miles south of Miami. The flight from Miami takes one hour, five minutes.

Cayman Airways is the national airline for these islands and has been carrying divers for more than 20 years. It operates nonstop 727 jet service from Miami to Grand Cayman at least twice daily—three flights on some days.

Cayman Airways also operates non-stop 727 jet flights several times weekly from Houston, Atlanta and Tampa. For flight information or for reservations, call Cayman Airways at (800) 422-9626.



DIVE PACKAGES FOR 1989

Coconut Harbour Resort offers a total of five different dive/hotel packages that provide maximum flexibility for the traveling diver. The packages are basically the same structure, but vary in length.

The shortest package is three nights at the resort with two days of diving. This includes a two tank morning dive on each of the two days.

VACATION INSTRUCTOR

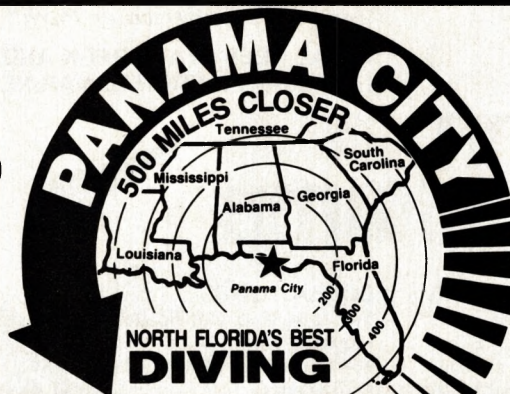
Coconut Harbour will be hosting a special one week instructor training course for certified divers who wish to progress to the instructor level. This course, taught by Pro Dive, one of the foremost instructor training organizations in the U.S., will be offered August 18 - 25.

Divers can now combine a week of Cayman diving with the educational challenge of becoming an instructor.

For information on the instructor training aspect of this week, please call Pro Dive at (800) 772-3483 or (305) 761-3413.

The dive packages are competitively priced with most Caribbean dedicated dive resorts. For example, a seven night/six day dive package costs \$586.50 per person, based on double occupancy in a pool view room. This package includes room, six days of diving, tanks, weights and unlimited shore diving. Not included in the package are hotel taxes, gratuities, meals or beverages. There are reduced rates for accompanying nondivers. The dive packages are in effect through December 14. For more information about Coconut Harbour dive packages, color brochures and reservations, contact Coconut Harbour Resort, 3574 Forest Edge Drive, Conyers, GA 30208. You can telephone toll free (800) 552-6281 (U.S.) or (404) 483-2336 (international) or fax (404) 483-2428.

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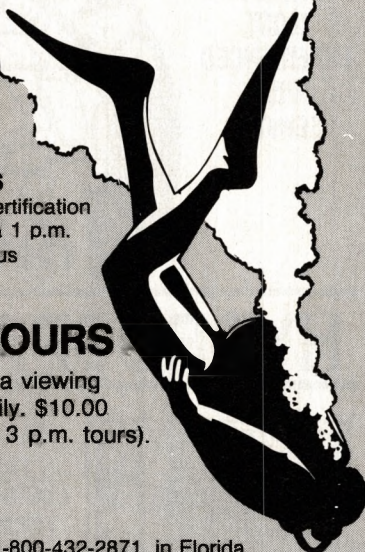
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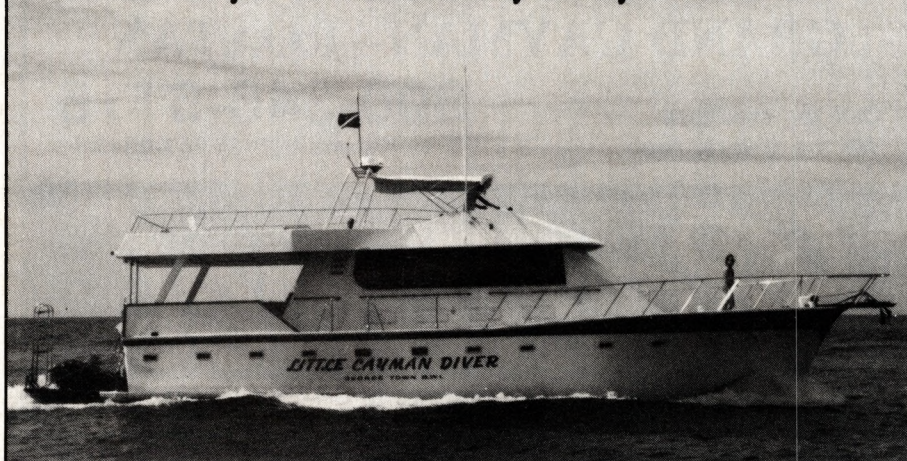
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FLOATING IN OIL

(Continued from Page 181)

an anchor. Having paddled to exhaus-
tion, Kurt was forced to return. The exer-
tion and the burning effect of the oil had
taken their toll: Kurt had to give it up.


We packed up and returned to the
shop. It was ten in the morning and we
were beat, especially Kurt. Now commer-
cial diving being what it is, wouldn't you
know the tanker terminal company called
again, and by nine that night we were
back on the deck of the tanker, this time
anchored upriver from the terminal.

After the previous dives, this night was
anti-climactic. The tanker crew, with
Christmas and home ahead of them, had
fiddled and diddled with a tag line, and by
using inspection ports, boat hooks and,
perhaps, trained pigeons, had managed
to pass a line from the entry port to the
vertical torque rod.

With the line to pull himself to the rod,
good gripping on the rod itself and the
knowledge gained from the previous
night, Kurt was soon at the valve stem
base. A few turns with a pipe wrench and
the valve was open.

Yes, Kurt still received a bonus—\$200
instead of \$500—and each of us received
a Christmas fifth of scotch. But, the real
bonus was what we'd learned.

I asked the captain about the density of
the oil. He said all crudes were different;
this Nigerian was a light crude, with a
specific gravity of 0.62. Pure water is
1.00. Seawater is 1.35. This crude was
twice as light as seawater.

So remember, adjust your weights ac-
cordingly when diving in crude oil, and
don't bother bringing your Nikons. 

DIVING MEDICINE

(Continued from Page 26)

pressure, so bottom times beyond 12
hours do not extend decompression time.
Our illustration shows how tissues be-
come saturated after a long dive. Divers
can stay for many days at depth with only
one decompression at the end of the job,
which is dependent only on the depth and
not on the time of the dive. Working dives
of up to 45 days have been conducted in
this way.

MEDICAL CONSIDERATION

Both commercial and military diving
have stringent health and fitness require-
ments. Candidates must be in excellent
health with no chronic illnesses. Usually
only those below age 35 are selected for
training, although divers often continue
working into their 40s and beyond. It is
important to be free of diseases such as

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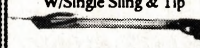
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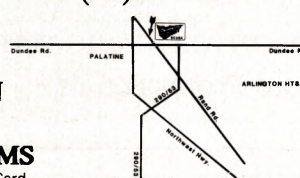
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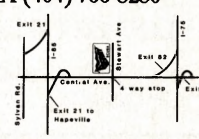
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DIVING MEDICINE

asthma, heart trouble, diabetes, back problems and bone disease. You may be accepted with marginal health status at a school but you are unlikely to get a job after you graduate. Commercial divers can develop bone injuries from decompression sickness so bone X-rays are required by many companies before a diver is hired.

Because of the depths and long bottom times the most important problem in commercial diving is decompression sickness. To solve this problem, research is done continuously to develop safer tables for air, helium and even hydrogen as diving gases. Although narcosis can be prevented by avoiding nitrogen, decompression sickness cannot. Most commercial and military dives that require long decompression or saturation diving have pressure chambers for decompression, so divers do not have to spend this time in the water. If a diver gets the bends while decompressing in a chamber the treatment is carried out in the same chamber by altering the decompression profile and adding oxygen breathing. Tables are now designed to prevent long term bone injury as well as the bends.

In deep diving, another important consideration is cold. Water temperatures of 38-40°F are common, and heated diving suits are needed to prevent lethal hypothermia. Pumping hot water to a diver working at 1,000 feet is just one of the technical problems of safe commercial diving. Occasionally hyperthermia is a problem. This is known to occur when diving in nuclear reactors where the water may be 90-100°F. When water temperature exceeds 88°F, heat cannot be given off from the body and hyperthermia will result. Limiting the exposure time in hot water environments prevents hyperthermia. Hyperthermia is also a problem when diving operations are conducted in hot climates. In this case, the surface workers suffer heat problems. A particularly severe environment is produced when a pressure chamber is placed on the open deck of a ship in hot climates.

Other problems include exposure to toxic materials when diving in contaminated water, injuries owing to trauma, infections of all types owing to the presence of local diseases (malaria in the tropics, for example); as well as such problems as oxygen toxicity, carbon dioxide and carbon monoxide poisoning.

Finally, the availability of jobs in commercial diving fluctuates, particularly with the fluctuation in demand for oil. It is always wise to have another skill that can be used when the demand for divers is low. Commercial diving remains a highly romantic, interesting and challenging occupation and will always beckon those interested in the mysteries of the sea.

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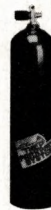
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With swivel mouthpiece
SILICONE

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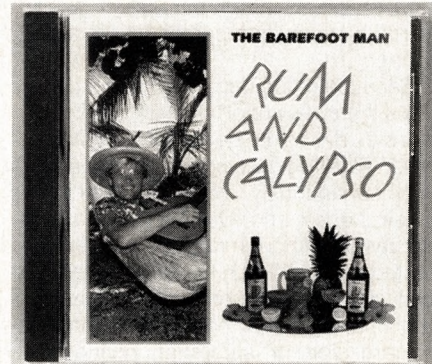
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\$184⁹⁵



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CAPTAIN SLATE'S

(Continued from Page 49)

home of the dive boat fleet, the compressors, rental scuba equipment classroom and the primary retail base. The boats dock just 20 steps from the gear rental cage and the whole complex has been designed to facilitate ease of access to the dive boats. The tastefully decorated store features a fine assortment of T-shirts and resort wear, post cards, dive books and magazines, scuba equipment and an underwater photo center.

Stephen Frink Photographic, Key Largo's most complete underwater photographic center, operates in close collaboration with Atlantis Dive Center and maintains the in-house underwater photo operations. This includes rental still and video cameras for underwater use, daily E-6 processing for Ektachrome or Fujichrome slide films, photographic equipment for sale and such services as instruction and custom videos. Frink Photo's staff will be available at Atlantis Dive Center prior to every boat departure and return to accommodate camera rentals and assist with photo related questions or problems.

While the physical presence of Captain Slate's Atlantis Dive Center is impressive, the popularity of the operation goes beyond the convenience factors built in and relates more to intangibles. Personality is one such intangible. Both Spencer and Amy Slate are keen, enthusiastic divers. Even after 11 years in the business, these are folks who love diving and are thrilled to share their underwater experiences with their guests. One example of their enthusiasm is reflected in the fish feeding activities conducted by Slate and his crew of divemasters.

Today a veritable underwater three ring circus has developed on some of the reefs where Slate has long practiced his fish feeding antics. Menacing looking barracuda will zoom to within scant millimeters of Slate's mouth to snatch a bally-hoo proffered from between clenched teeth. Giant green morays will twist and swirl about Slate's torso, greedily seeking their share of the bait while spotted morays and groupers wait impatiently for any overlooked scraps. This whole activity is thrilling to observe, creates a wonderful photo opportunity and is today probably the most requested underwater activity offered by the Atlantis crew. But, it started almost by chance.

Because of his love of the reef residents he was seeing on his daily dives, Slate began to feed them. The fish approached timidly at first and then with greater trust. The marine life around the most frequently visited sites became somewhat desensitized and a bond grew. The same animals would show up day after day and Slate gave them

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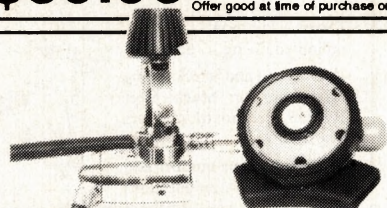
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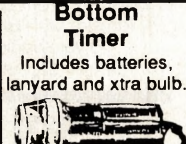
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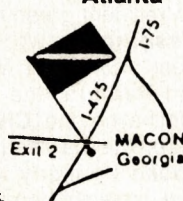
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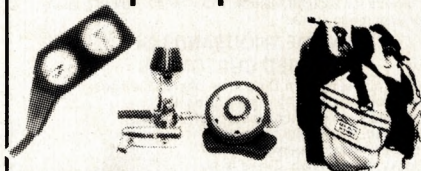
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Pathfinder Reg.

Sea Elite fully balanced, latest design, high performance regulator. List \$300.00.

List \$881.00 **\$457.85**

Super Special 27



Sea Elite Phoenix DX Bladderless B.C.

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Parkway console

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CAPTAIN SLATE'S

names. Ultimately he became so confident in his ability to control the feeding sessions, even with potentially dangerous predators such as the barracuda and eels, that Slate began holding the bait in his mouth rather than his hands.

Now there is Smokey, the giant barracuda of **Elbow Reef**; Perry and Melba, the resident green morays at the **City of Washington** wreck site; Moses, the green moray on **Mike's Wreck**; Slime and Barbara, the spotted moray eels dominating the **Civil War Wreck**; and Mike, the barracuda from **North Dry Rocks** (formerly known as Flash, but now named in honor of south Florida dive pioneer Mike Kevorkian). All are in residence at reef sites throughout the north end of the Key Largo National Marine Sanctuary and all eagerly await Slate and crew with anticipation and motivation. Observing the show is enough to keep the adrenaline flowing and makes for a fascinating entry in one's logbook.

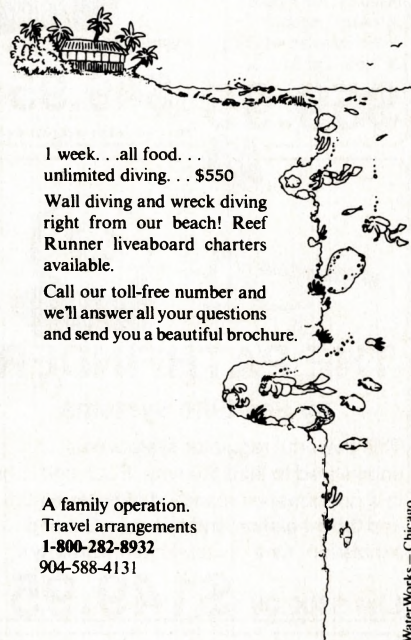
Of course, there is more to the Atlantis dive itinerary than just fish feeding. The boats will generally visit the reefs near the north end of the sanctuary and will dive traditional favorites such as the **Elbow**, **Christ of the Abyss**, **Carysfort** and **South Carysfort Reefs** and the **Minnow Caves**. These sites offer historical interest, beautiful coral formations and, as is typical of the sanctuary, amazing quantities of colorful tropical fish. Special trips to the south end of the sanctuary to sites such as the **Benwood** wreck and **French** and **Molasses Reefs**, are offered on occasion. Charters to the sunken U.S. Coast Guard cutters **Bibb** and **Duane** are featured quite regularly.

Captain Slate's Atlantis Dive Center works very closely with the Key Largo Howard Johnson Resort and refers most of its dive/lodging packages there. Manager Itzik Laron enjoys a close rapport with his divers in residence. He provides not only price advantages to Atlantis customers but also convenience factors such as late checkout (so divers can make the morning dive trip and still get a refreshing freshwater shower at the hotel before leaving town) and free breakfast, available any time from 6:00 am until midnight. Probably the most popular package option is free lodging! Of course there is a catch, but not a painful one. If four nights are booked into the resort during the week on a dive package, the fifth day of diving and lodging are absolutely free. Group discounts are also available for 10 or more in dive/lodging packages. Many other diver convenience features have been integrated into the Howard Johnson Key Largo Resort.

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In their 11 years of service to the divers of Key Largo, Spencer and Amy Slate have created an efficient, professional dive service, yet one that has maintained a sense of individual style and personality. To learn more about their packages and programs, please contact Captain Slate's Atlantis Dive Center at (800) 331-DIVE; in Florida at (305) 451-1325 or 451-3020. Mail inquiries may be directed to 51 Garden Cove Drive, Key Largo, Florida 33037. All Atlantis reservationists are certified divers intimately familiar with the offshore reefs. If you have specific dive related questions, the Atlantis staff will be happy to assist you.

DIVERS WEST MOVES

Pasadena, California's Divers West has moved to 2333 East Foothill Boulevard, Pasadena. The Five-Star PADI facility has expanded both its offices and diver services. Divers West now has two classrooms. Along with open water, advanced, rescue and divemaster training, it offers an extensive choice of specialty classes including medic/first aid, wreck, deep, underwater photography, hunter and ice diving. New this year is a unique course in recreational snorkeling. Divers West will soon be a PADI Five Star Instructor Development Center.

Another exciting expansion is the Divers West Travel Center, with services to fit any schedule. Divers West will arrange vacations to exotic dive locations or weekend diving in local waters at the customer's convenience. The store's personally guided trips are currently highlighting the unique island of Sipidan in Borneo, and that old favorite, Cozumel.

Divers West carries all major brands of diving equipment. It has a full rental department and repair service. For more details contact Richard Escoto, Susan Speck or Carolyn Murray at (818) 796-4287. Store hours are Monday-Friday 10:00 am to 7:00 pm and Saturdays 9:00 am to 6:00 pm.

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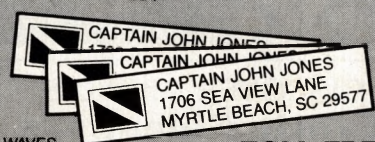
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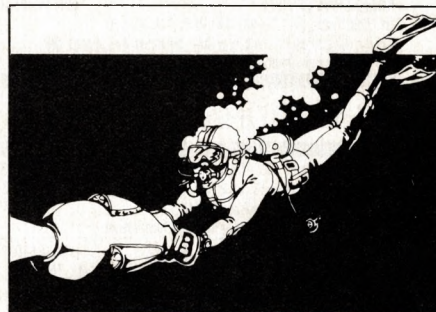
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I LEARNED ABOUT DIVING FROM THAT

Mike's story: The morning of the dive was typical of a Long Island, New York summer: hazy, hot and very humid. After loading our gear onto the boat, my buddy Chris and I could hardly wait to get into open water, hoping the temperature would be cooler. Before long, we were out of the harbor and cruising toward our destination, the wreck of the *Fran S.*, a tugboat sunk in 80 feet of water. However, as we began the 45 minute trip to the wreck, the sky began to cloud up. At first, this appeared to be a stroke of luck as the blazing sun was hidden by the clouds. In a few seconds, the first drops of rain began to fall. This didn't bother us because Chris and I don't mind diving in a little rain. To use the old diver's cliché, we were going to get wet anyway! As we traveled farther from shore the clouds began to get darker. I began to feel a little uneasy as the sky became a sinister black.

As we neared the dive site, the first cracks of thunder were heard. In a moment, I spotted lightning striking the water in the distance. Undaunted, the captain went about his business of locating the wreck and securing the anchorline. By this time the rain was coming down harder and many lightning bolts were striking the water. As nervous as we both were about this sudden storm, we somehow felt that things would be better (and safer) 80 feet below.

As the rain began to fall even harder, the captain announced it was all right to enter the water. Since we are photographers, Chris and I usually try to get down to the wreck before other divers can ruin the visibility by stirring up silt. Because of this and our sense of urgency about the weather, we suited up quickly. In a few short moments I was in the water. Chris remained on the boat, making some final adjustments. Normally, I would swim to the front of the boat and wait for my buddy on the anchorline but something told me to stay at the back of the boat today, just in case!

Suddenly, it began to hail and the wind picked up. With Chris still on the boat, I finally came to my senses and began to make my way back to the dive ladder. The ocean was becoming rough and I tried to motion to him to abort the dive. It was too late. He was just about ready to enter the water when a large wave rocked the boat. Caught off balance, he was tossed in. At this precise moment, chaos broke loose. Instantly, the wind increased to 65 mph and torrents of rain began to fall. I grabbed the trail line with all my strength because accompanying the wind was a sudden, severe current that was impossible to fight; I was whipped about like a flag on a flagpole. I could see nothing below the surface as the water had become a foamy maelstrom. Above the surface, visibility had dropped to a few feet as sheets of rain and salt spray were driven by the wind. The scariest part of this adventure was that my buddy was gone!

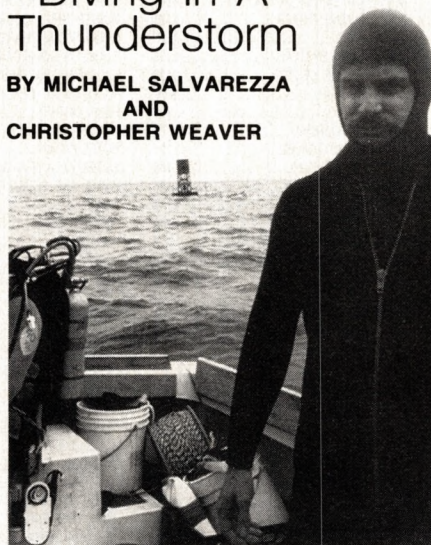
As I tried to climb up the ladder, I heard the divemaster screaming at me above the noise of the storm.

"Where's your buddy?" he yelled. I had no answer. I had seen Chris fall into the water but had not seen him come up. I knew the current was too strong for him to reach the front of the boat and the anchorline, and I didn't think he would try to descend into the murky Atlantic water without this line. All I could think was that he had been swept away.

After managing to scramble back onto the boat, I joined the crew in a frantic search for Chris. We could barely see 10 feet from the boat because of the weather. The howling wind made hearing almost impossible.

Diving In A Thunderstorm

BY MICHAEL SALVAREZZA
AND
CHRISTOPHER WEAVER



Chris' story: With Mike already in the water and the weather worsening, I thought it best to hurry with my final equipment check and get into the water. I also felt things would be better down on the wreck, but as I tilted my head back to put my mask on, I was stuck squarely between the eyes by a large hailstone! I noticed at this time that the clouds were an eerie shade of green and that it was really beginning to hail, accompanied by more heavy rain.

With my nose throbbing from the hailstone, I made my way to the back of the boat and stood on the platform, ready to jump in. I spotted Mike holding onto the trail line and being tossed about in an increasingly rough sea. Suddenly, the boat pitched forward and I lost my balance. In a second, I was in the water. My first instinct was to grab for the trail line but, as I reached out to where I thought it was, I found no line. I quickly surfaced to get my bearings and found my visibility cut down to almost nothing. The rain and wind swept water were creating a near white-out! As I peered through the chaos, I could barely see the boat. Then I realized I was in a tremendous current and drifting away from the boat!

I immediately tried to organize my thoughts. Don't panic, I kept saying to myself as I tried

to get my bearings. The current was far too strong to fight and I could barely see a few feet in the conditions. I soon abandoned all ideas of swimming back to the boat. I also knew that trying to dive in the boiling sea would be suicidal. Suddenly, above the roar of the wind, I heard a bell ringing. I remembered there was a large bell buoy a few hundred yards from the wreck site that marked the end of a fish haven. My pulse quickened as I spotted the buoy, but my momentum in the current was carrying me past it. I recalled a chapter in an advanced diving textbook I had recently read that said if you were ever caught in open water in an emergency and there was a stationary object (such as a buoy) in the area, make your way to the object and stay there. I made a Herculean effort to reach the buoy. It was all that stood between me and miles of open water!

As I approached the buoy, I saw it bobbing up and down violently in the heavy seas. The buoy was 10 or 15 feet high and had a large metal loop on the side. I grabbed the loop and, even though I felt as if my arm was going to be ripped off, I hung on for dear life! I even made an attempt to crawl out of the water and onto the buoy itself, but this was impossible: By this time, I was too tired.

I could see nothing but rain and sea spray. I noticed I was already down to 1,500 psi, but I still wasn't panicking. The storm had to abate some time, I thought. Soon, the wind slowly began to die down and after awhile the rain began to let up. As the visibility began to increase, I saw a boat nearby. I didn't realize at first that it was my own boat, but I didn't care. I tried waving my arms, but the storm was still strong enough to negate this action.

Suddenly, I spotted an orange object approaching me in the water. I was startled at first, until I realized it was a diver swimming toward me holding an orange float. He approached within a few feet and, as soon as I could clearly see him, I gave him the OK sign. He seemed suddenly reassured and quickly passed the life ring over to me. Within seconds, we were being hauled back to the boat.

After resting for awhile and waiting for this freak storm to blow over, we managed to make our scheduled two dives on the wreck. The dives were not memorable, but the lessons learned that day were invaluable. Despite what the captain, divemaster or anybody else may say, if you do not feel the conditions are right for you, do not enter the water! Always check the weather before diving, even if you are traveling on a charter boat. Yes, the captain should be aware of the weather forecast (we later learned that severe weather warnings had been posted all day) but it's your life and not his we're talking about! Finally, if you should be swept away from your boat in open water, *Do not panic!* Inflate your BC and, if possible, swim for a recognizable landmark. Holding onto a buoy gives you the best chance for being spotted from a search boat or plane. Remember, be careful out there!

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